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HEPATITIS

SURVEILLANCE

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Preface

Hepatitis Surveillance, No. 60 presents statistics and trends in viral hepatitis in the United States through 2003. This publication, which summarizes viral hepatitis case reports received from state health departments, is intended as a reference document for policy makers, program managers, health planners, researchers and others who are concerned with the public health implications of these diseases. Any comments and suggestions that would improve the usefulness of future publications are appreciated and should be sent to Chief, Surveillance Team, Division of Viral Hepatitis, Centers for Disease Control and Prevention, 1600 Clifton Road, Mailstop G37, Atlanta, GA 30333.

Acknowledgments

Publication of this report would not have been possible without the contributions of the State and Territorial Health Departments that provide state and local surveillance data to the Centers for Disease Control and Prevention.

This report was prepared by the following staff members of the Surveillance Team of the Epidemiology Branch of the Division of Viral Hepatitis, National Center for Infectious Diseases: Annemarie Wasley, Jeremy Miller, and Lyn Finelli.

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Conditions under surveillance

National surveillance is conducted for acute hepatitis A, acute hepatitis B, and acute hepatitis C. Case definitions for these conditions are below. Nationwide reporting of perinatal HBV infection was implemented in 2001. In addition, chronic hepatitis B virus (HBV) infection and hepatitis C virus (HCV) infection, past or present were added to the list of nationally notifiable conditions in January 2003. This publication summarizes information received about reported cases of acute disease.

Sources of data

Cases of acute hepatitis are reported to CDC by state and territorial health departments on a weekly basis via the National Notifiable Diseases Surveillance System (NNDSS). As of January 1, 2002, all reports are received electronically by CDC via NETSS (National Electronic Telecommunications System for Surveillance).

Participation by states in the reporting of viral hepatitis cases to CDC is voluntary as it is for all nationally notifiable diseases. Currently, all states collect and report basic information (event date, source of report, demographic characteristics) about cases of acute viral hepatitis that are identified in their states. States are also asked to report additional information (laboratory test results, clinical information and exposure history) about investigated cases. Completeness of reporting of these additional data varies among and within states. Currently, approximately 30% of case reports received by CDC include extended data. See Table 1 for information on state-specific reporting profiles.

Analyses

Incidence rate calculations

Crude incidence rates of new cases were calculated on an annual basis per 100,000 population using Bureau of the Census estimates of the U.S. resident population.

Frequency analysis

The percentage of cases reporting a specific risk factor is determined using the number of cases reporting any information, positive or negative, about that exposure as the denominator. Depending on the type of hepatitis, the percentage of cases reported with any risk factor information ranges from 30-40%. Multiple risk factors can be reported by a single case. Consequently, the percentages associated with the specific risk factors may sum to >100%.

Table 1: Proportion of Reported Cases That Included Risk Factor Data, by State, 2003

81%-100%	61% - 80%	41-60%	11-40%	0-10%
Alabama	Colorado	Hawaii	Arizona	Alaska
Arkansas	Iowa	Michigan	Connecticut	California
Florida	Kentucky	Nebraska	Illinois	Delaware
Kansas	Montana	New Mexico	Louisiana	District of Columbia
Maine	New York	Wyoming	Massachusetts	Georgia
Maryland	North Dakota		Missouri	Idaho
Minnesota	Utah		Virginia	Indiana
Nevada	Wisconsin			Mississippi
North Carolina				New Hampshire
Ohio				New Jersey
Oklahoma				New York City
Pennsylvania				Oregon
Rhode Island				South Carolina
South Dakota				Tennessee
Vermont				Texas
Washington				
West Virginia				

Data Limitations

There is considerable variability by state in terms of both the sensitivity of reporting (i.e. frequency of underreporting) and the completeness of individual case reports. Information to assess the degree of underreporting is not available. Only 30% of cases are reported with extended case investigation data (e.g., clinical characteristics, exposure history) and this percentage varies by state from 0 to 100% (see Table 1). Analyses of trends in the characteristics of reported cases are based on records for which this information is complete; it is not known if or how cases that are reported with complete data differ from those for which data are missing or from those that are not reported.

Case definitions

Reported cases must meet the clinical criteria and be serologically confirmed.

Clinical case definition

An acute illness with a) discrete onset of symptoms and b) jaundice or elevated serum aminotransferase levels

Laboratory criteria for diagnosis:

- *Hepatitis A*:
    - Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive

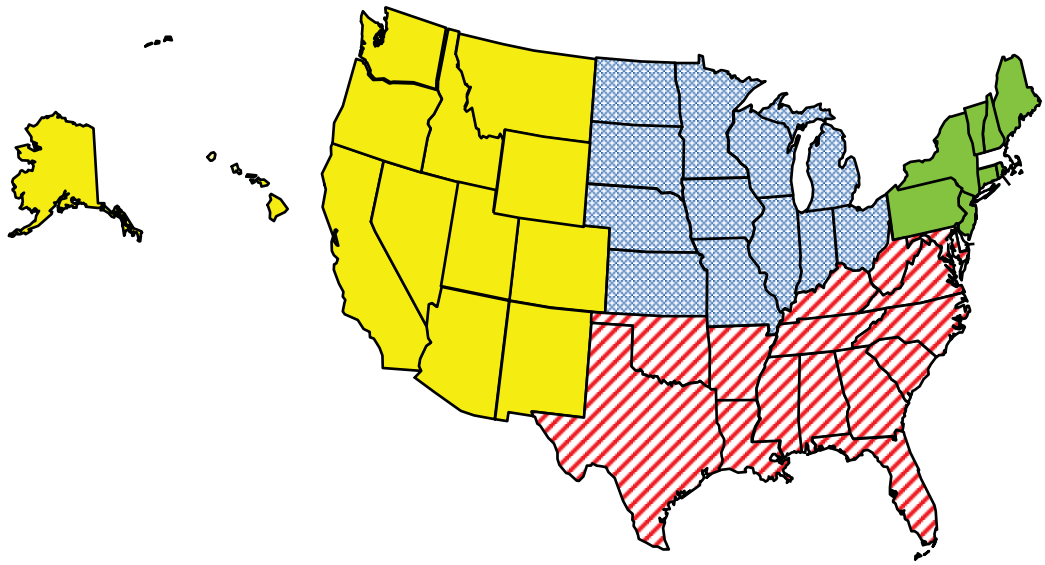
- *Hepatitis B*:
    - IgM antibody to hepatitis B core antigen (anti-HBc) positive or hepatitis B surface antigen (HBsAg) positive
    - IgM anti-HAV negative (if done)
- *Hepatitis C*:
    - Serum alanine aminotransferase levels greater than 7 times the upper limit of normal, and
    - IgM anti-HAV negative, and
    - IgM anti-HBc negative or if not done, HBsAg negative, and

- One of the following:
    - Antibody to hepatitis C virus (anti-HCV) screening-test-positive, verified by an additional more specific assay (e.g. RIBA for anti-HCV or nucleic acid testing for HCV RNA) OR
    - Anti-HCV screening-test-positive with a signal to cut-off ratio predictive of a true positive as determined for the particular assay (e.g., >3.8 for the enzyme immunoassays).

Case classification

Confirmed: a case that meets the clinical case definition and is laboratory confirmed or, for hepatitis A, a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

Figure 1. Geographic Divisions of the United States



West	Midwest	South	Northeast
Alaska	Illinois	Alabama	Connecticut
Arizona	Indiana	Arkansas	Maine
California	Iowa	Delaware	Massachusetts
Colorado	Kansas	District of Columbia	New Hampshire
Hawaii	Michigan	Florida	New Jersey
Idaho	Minnesota	Georgia	New York
Montana	Missouri	Kentucky	Pennsylvania
Nevada	Nebraska	Louisiana	Rhode Island
New Mexico	North Dakota	Maryland	Vermont
Oregon	Ohio	Mississippi	
Utah	South Dakota	North Carolina	
Washington	Wisconsin	Oklahoma	
Wyoming		South Carolina	
		Tennessee	
		Texas	
		Virginia	
		West Virginia	

Figure 2: Incidence of reported viral hepatitis, United States, 1966-2003

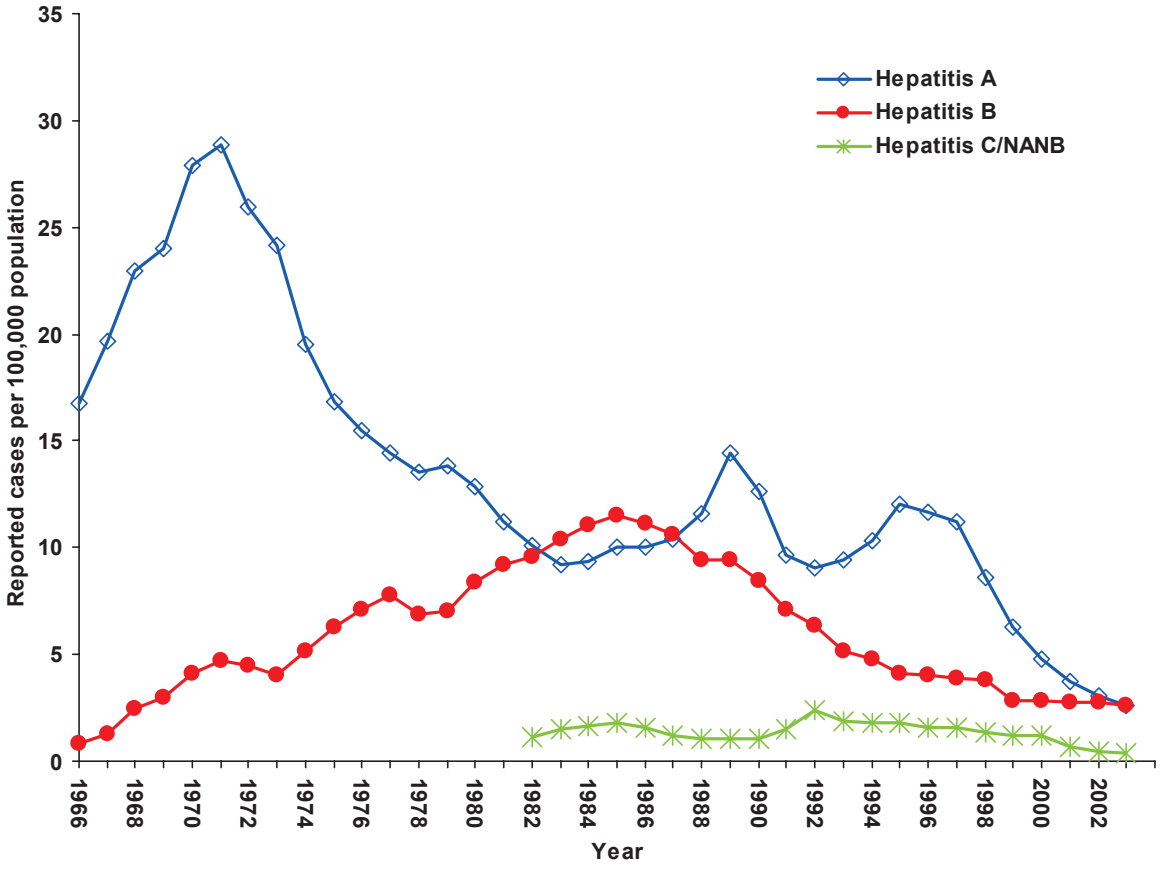


Table 2: Reported cases of acute viral hepatitis, by type and year, United States, 1966-2003

	Hepatitis A		Hepatitis B		Hepatitis C/NANB	
Year	No.	Rate**	No.	Rate	No.	Rate
1966	32,859	16.8	1,497	0.8	***	***
1967	38,909	19.7	2,458	1.3	***	***
1968	45,893	23.0	4,829	2.5	***	***
1969	48,416	24.0	5,909	3.0	***	***
1970	56,797	27.9	8,310	4.1	***	***
1971	59,606	28.9	9,556	4.7	***	***
1972	54,074	26.0	9,402	4.5	***	***
1973	50,749	24.2	8,451	4.0	***	***
1974	40,358	19.5	10,631	5.2	***	***
1975	35,855	16.8	13,121	6.3	***	***
1976	33,288	15.5	14,973	7.1	***	***
1977	31,153	14.4	16,831	7.8	***	***
1978	29,500	13.5	15,016	6.9	***	***
1979	30,407	13.8	15,452	7.0	***	***
1980	29,087	12.8	19,015	8.4	***	***
1981	25,802	11.3	21,152	9.2	***	***
1982	23,403	10.1	22,177	9.6	2,629**	1.1
1983	21,532	9.2	24,318	10.4	3,470*	1.5
1984	22,040	9.3	26,115	11.1	3,871*	1.6
1985H	23,257	10.0	26,654	11.5	4,192*	1.8
1986H	23,430	10.0	26,107	11.2	3,634*	1.6
1987	25,280	10.4	25,916	10.7	2,999*	1.2
1988	28,507	11.6	23,177	9.4	2,619*	1.1
1989	35,821	14.4	23,419	9.4	2,529*	1.0
1990	31,441	12.6	21,102	8.5	2,553*	1.0
1991	24,378	9.7	18,003	7.1	3,582*	1.4
1992	23,112	9.1	16,126	6.3	6,010	2.4
1993	24,238	9.4	13,361	5.2	4,786	1.9
1994	26,796	10.3	12,517	4.8	4,470	1.8
1995	31,582	12.0	10,805	4.1	4,576	1.7
1996	31,032	11.7	10,637	4.0	3,716	1.4
1997	30,021	11.2	10,416	3.9	3,816	1.4
1998	23,229	8.6	10,258	3.8	3,518	1.3
1999	17,047	6.3	7,694	2.8	3,111	1.1
2000	13,397	4.8	8,036	2.9	3,197	1.1
2001	10,615	3.7	7,844	2.8	1,640 I	0.7I
2002	8,795	3.1	8,064	2.8	1,223 ¥	0.5¥
2003	7,653	2.6	7,526	2.6	891¥	0.4¥

Source: National Notifiable Diseases Surveillance System * Numbers and rates shown for hepatitis C/ Non-A, non-B hepatitis are unreliable -. Rate per 100,000 population. *** Not reported until 1982. ⊥ Excludes cases from New York City; data not available for 1985 or 1986.I Excludes cases from New Jersey and Missouri. ¥ Excludes cases from Missouri**

Table 3: Incidence of reported acute viral hepatitis, by type, state and year, United States

Hepatitis A

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Alabama	2.4	1.1	1.3	1.4	3.3	2.2	5.0	2.0	1.8	1.4	1.3	1.8	0.9	0.5
Alaska	34.3	16.8	22.1	129.3	34.6	8.3	8.9	5.5	2.7	2.4	2.1	2.5	1.9	1.5
Arizona	53.7	29.5	31.3	36.7	50.9	30.8	38.5	49.2	37.7	13.9	9.0	7.7	5.6	5.0
Arkansas	25.6	10.9	6.4	3.0	10.1	26.1	19.4	8.6	3.1	3.1	5.4	2.7	2.7	1.4
California	21.4	16.5	15.9	18.2	21.0	21.3	20.8	19.8	12.7	10.3	8.8	5.3	4.1	3.2
Colorado	10.7	20.0	25.3	24.3	15.7	13.3	13.1	10.0	8.4	5.2	5.2	2.0	1.6	1.4
Connecticut	4.2	3.8	2.5	3.5	3.0	2.6	4.2	4.4	2.9	3.8	5.2	7.0	2.7	2.6
Delaware	14.3	1.9	8.1	1.7	3.1	1.6	2.8	4.1	0.8	0.3	1.9	2.0	1.9	1.1
District of Columbia	6.4	12.8	2.8	1.8	4.6	4.5	6.8	6.3	11.7	10.3	7.0	13.9	14.2	7.6
Florida	5.2	6.4	4.3	5.1	5.4	4.6	4.9	5.3	3.9	5.4	4.1	5.2	6.3	2.3
Georgia	5.8	3.7	3.3	2.1	0.6	1.1	5.5	9.9	11.2	6.0	4.6	11.1	5.9	9.1
Hawaii	9.5	7.8	14.8	5.9	4.9	13.9	10.0	12.2	4.4	2.0	1.1	1.4	2.0	1.0
Idaho	9.5	9.5	12.7	26.9	33.2	30.0	20.5	12.2	18.8	3.7	3.5	4.3	2.3	1.3
Illinois	15.1	12.1	6.7	8.7	5.2	5.5	6.3	7.1	6.7	6.9	5.6	3.5	2.1	1.5
Indiana	4.6	8.8	14.1	11.3	6.2	3.2	6.2	5.5	2.9	1.7	2.2	1.7	0.8	1.2
Iowa	10.1	1.7	1.9	2.1	2.2	3.7	11.6	16.9	13.8	5.5	2.3	1.2	2.2	1.4
Kansas	10.9	3.6	5.6	3.1	4.3	6.2	15.0	9.9	4.1	2.5	4.1	6.7	2.6	1.0
Kentucky	2.5	1.9	3.7	3.7	5.7	1.1	1.4	2.0	0.8	1.7	1.6	3.6	1.1	0.9
Louisiana	5.3	3.5	5.5	2.4	3.9	4.5	5.9	6.0	3.9	4.8	2.4	1.9	2.0	1.1
Maine	0.9	1.7	2.3	1.1	2.0	2.4	2.2	5.3	1.6	2.1	1.7	0.9	0.6	1.6
Maryland	19.8	5.6	5.2	3.2	3.9	4.4	5.0	3.6	8.0	5.8	4.0	5.5	5.5	3.2
Massachusetts	6.6	4.8	4.8	3.5	1.8	2.6	3.7	4.1	2.0	2.2	2.2	5.9	2.2	3.4
Michigan	4.1	3.1	1.6	2.2	3.7	3.8	5.2	14.0	21.7	12.7	4.9	3.3	2.2	2.0
Minnesota	7.4	10.9	19.7	10.9	5.7	4.2	3.7	5.1	3.0	2.6	3.7	0.9	1.1	1.0
Mississippi	1.8	1.3	1.6	2.3	2.9	8.2	8.2	3.5	2.5	4.5	5.0	1.3	2.2	0.6
Missouri	12.1	12.6	28.8	27.4	11.6	24.9	26.0	21.0	11.5	12.8	4.6	1.6	1.5	1.1
Montana	19.9	10.1	10.5	9.1	2.9	19.7	14.7	8.0	10.8	2.0	0.8	1.8	1.4	0.9
Nebraska	6.6	15.5	16.5	12.0	7.4	3.9	9.3	6.7	1.6	3.1	2.2	2.2	1.1	0.8
Nevada	26.3	24.0	8.2	12.3	16.9	21.1	26.9	24.8	12.2	7.5	4.5	3.3	2.5	2.3
New Hampshire	0.8	2.7	2.9	1.6	1.5	1.1	1.9	2.9	1.6	1.5	1.5	1.4	0.9	1.5
New Jersey	5.6	4.2	3.9	3.7	3.8	3.9	4.8	3.8	4.1	1.8	3.4	3.3	2.2	2.4
New Mexico	71.0	44.5	21.5	24.4	65.4	47.0	20.3	19.8	8.6	3.0	3.8	2.2	1.7	1.3
New York	11.4	10.6	6.8	6.5	8.0	8.3	5.6	7.0	5.2	3.7	4.2	4.1	3.3	3.1
North Carolina	9.7	2.4	1.6	1.3	2.0	1.5	2.7	2.8	1.6	2.1	1.9	2.9	2.5	1.5
North Dakota	5.2	10.4	22.4	12.5	0.9	3.6	21.5	2.2	0.6	0.5	0.6	0.5	0.6	0.3
Ohio	2.7	3.3	4.1	3.0	10.8	15.7	7.0	2.9	3.5	5.8	2.3	2.3	2.6	1.5
Oklahoma	19.2	8.9	6.8	6.5	12.8	43.1	77.4	42.8	19.6	15.5	7.9	3.3	1.5	0.8
Oregon	29.0	15.3	18.4	17.4	39.8	85.5	26.9	11.4	13.0	7.4	5.0	3.0	1.8	1.7
Pennsylvania	15.0	3.5	2.1	1.5	1.8	2.0	4.5	4.1	3.4	3.0	3.6	2.5	2.4	8.2
Rhode Island	5.2	11.3	16.8	7.6	3.0	3.4	2.5	12.8	1.7	3.4	3.0	7.1	3.2	1.6
South Carolina	1.3	1.1	0.6	0.5	1.1	1.2	1.5	2.8	1.4	1.2	2.4	2.1	1.6	1.4
South Dakota	70.7	118.9	30.2	2.5	5.3	13.4	5.8	3.6	5.4	1.3	0.4	0.4	0.4	.
Tennessee	4.4	3.1	2.3	2.0	6.6	36.6	14.4	7.6	4.2	2.6	2.7	3.3	2.1	3.5
Texas	16.0	15.3	10.3	15.4	15.5	15.8	17.9	22.9	17.6	12.2	9.2	2.6	3.9	2.8
Utah	35.2	16.1	37.8	43.6	38.5	34.6	51.9	25.9	9.0	2.9	3.2	2.9	2.4	1.7
Vermont	1.1	4.2	2.4	1.6	2.4	1.4	2.0	2.5	2.8	4.0	1.6	2.6	0.6	1.0
Virginia	4.9	3.0	2.6	2.4	2.9	3.6	3.2	3.7	3.3	2.6	2.3	2.3	2.2	1.9
Washington	28.1	12.1	16.7	17.5	20.8	17.1	18.0	17.9	18.0	8.6	5.0	3.1	2.7	1.2
West Virginia	1.3	1.2	0.6	1.6	1.3	1.3	1.0	0.7	0.5	2.6	3.1	1.6	1.3	2.1
Wisconsin	9.8	15.7	18.6	10.0	4.8	3.5	3.8	3.6	3.5	1.5	2.0	1.6	3.6	0.8
Wyoming	16.1	29.4	3.0	3.6	8.5	22.7	8.4	7.2	7.5	1.8	0.8	1.4	0.6	0.4

Hepatitis B

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Alabama	4.1	4.1	3.3	2.5	2.1	2.7	1.8	1.8	1.7	1.9	1.6	2.0	2.3	2.1
Alaska	10.5	7.2	3.6	2.5	2.2	2.2	2.6	2.4	2.1	2.9	2.1	1.6	1.9	1.2
Arizona	13.2	4.7	5.1	2.4	2.4	2.7	5.2	4.3	3.8	2.7	4.2	3.1	4.6	5.1
Arkansas	5.2	6.5	4.5	3.7	2.4	3.3	3.6	4.1	4.4	3.7	4.1	4.0	4.4	3.3
California	9.8	8.6	9.2	6.0	6.5	5.5	5.3	5.1	4.4	3.7	3.2	2.5	1.7	1.9
Colorado	5.9	4.2	3.5	2.2	2.6	3.6	3.4	3.7	2.5	2.3	2.5	2.3	1.8	1.8
Connecticut	7.8	5.9	4.8	2.3	2.9	2.6	2.5	1.7	1.1	1.2	1.4	1.4	2.0	2.8
Delaware	14.6	7.9	30.1	2.5	2.0	1.2	1.2	0.9	0.5	0.1	1.9	3.6	1.7	1.7
District of Columbia	21.3	26.1	14.2	7.2	9.0	3.6	5.6	5.3	3.4	4.4	6.1	2.3	3.9	2.3
Florida	7.4	7.1	6.8	6.1	5.3	4.6	4.5	4.3	3.3	3.7	3.8	3.1	3.2	3.7
Georgia	8.3	8.9	4.7	9.6	7.8	1.4	0.8	2.9	2.7	2.9	4.3	5.2	5.7	7.7
Hawaii	9.5	4.4	1.6	1.9	2.4	2.7	1.2	0.9	1.5	1.3	1.0	1.8	1.0	2.1
Idaho	9.1	7.0	7.8	8.0	6.7	8.7	7.3	4.4	3.9	2.3	0.8	0.8	0.5	0.6
Illinois	5.2	3.6	3.4	2.9	2.6	2.4	2.8	2.3	1.9	1.6	1.4	1.7	1.5	1.0
Indiana	6.6	4.1	4.0	4.3	3.7	4.1	2.4	1.7	2.0	1.3	1.4	1.2	1.4	1.1
Iowa	1.9	1.5	1.2	1.3	0.9	1.6	2.6	1.5	1.9	1.5	1.3	0.8	0.7	0.6
Kansas	5.6	2.4	2.6	2.5	1.2	2.0	1.2	1.2	1.1	0.6	1.0	0.5	0.9	0.7
Kentucky	12.6	5.2	2.9	2.6	2.0	1.8	1.9	1.1	1.2	1.2	2.0	1.6	1.6	2.3
Louisiana	8.9	9.1	6.1	6.2	4.7	5.5	4.8	4.7	4.9	3.9	3.5	2.8	3.0	2.6
Maine	2.4	2.6	2.2	0.9	0.9	1.0	0.6	0.5	0.4	0.2	0.4	0.5	1.1	0.5
Maryland	11.8	8.0	8.2	5.3	7.0	5.2	3.3	3.3	2.7	2.8	2.5	2.6	2.4	2.4
Massachusetts	10.7	9.1	6.4	3.5	3.3	1.9	1.8	1.2	1.3	0.7	0.2	0.6	2.6	3.3
Michigan	6.9	6.5	6.2	4.1	4.5	4.1	4.3	4.7	4.8	5.1	4.3	6.2	3.3	2.2
Minnesota	2.8	2.3	2.1	2.1	1.8	2.0	2.0	1.3	1.5	1.6	1.2	0.9	1.0	1.1
Mississippi	4.8	2.9	13.1	14.7	.	.	8.9	6.5	3.4	4.6	3.9	3.3	3.2	3.9
Missouri	12.3	10.6	10.3	11.1	10.1	8.1	6.0	6.6	4.6	4.1	2.7	2.3	2.1	4.3
Montana	9.4	8.6	4.8	3.3	2.4	2.7	2.4	1.3	0.9	2.3	0.9	0.3	1.1	1.7
Nebraska	2.1	2.5	2.8	1.2	1.9	2.4	2.3	1.5	1.4	1.3	2.6	2.0	1.8	1.8
Nevada	24.2	14.9	7.9	5.2	3.9	4.1	5.7	4.5	4.4	3.0	2.7	2.5	3.3	3.9
New Hampshire	3.7	3.0	4.5	2.4	2.5	2.0	1.8	1.5	1.7	1.4	1.5	1.3	2.0	1.9
New Jersey	7.0	6.2	6.5	5.1	5.1	4.6	3.4	3.0	2.5	1.7	2.1	3.4	4.0	2.1
New Mexico	15.4	13.2	13.1	13.1	13.0	18.7	23.8	14.5	17.3	11.9	7.9	7.4	7.9	1.9
New York	7.6	5.2	5.2	4.4	5.1	5.1	4.6	4.4	3.7	2.6	3.7	4.3	4.6	1.6
North Carolina	16.4	8.3	6.2	4.5	4.0	4.2	4.5	3.5	3.1	2.8	3.2	2.7	2.8	1.9
North Dakota	1.3	0.3	0.6	0.2	0.2	0.8	0.3	1.1	0.6	0.3	0.5	0.3	1.3	0.3
Ohio	3.6	3.7	2.1	1.7	1.5	1.0	1.1	0.8	0.7	0.8	0.9	0.8	1.0	1.4
Oklahoma	5.7	6.5	5.9	6.0	4.3	5.2	1.7	2.0	5.1	5.4	5.2	3.3	3.1	2.2
Oregon	14.7	10.5	10.2	7.2	5.1	4.1	4.0	3.6	6.0	3.4	3.6	4.8	3.6	3.4
Pennsylvania	6.2	4.2	4.1	2.9	3.3	2.4	2.3	2.8	2.9	2.4	2.2	2.7	2.8	2.4
Rhode Island	5.3	2.8	2.0	1.9	0.8	1.0	1.9	2.1	7.3	4.1	4.4	3.1	3.4	2.0
South Carolina	17.8	18.7	1.5	1.4	0.9	1.5	2.7	2.6	1.7	1.6	0.6	1.8	3.3	4.8
South Dakota	1.1	1.3	0.7	.	0.5	0.3	0.7	0.1	0.5	0.1	0.3	0.1	0.4	0.5
Tennessee	17.7	19.0	20.9	22.4	19.9	12.1	9.5	8.3	5.3	3.7	4.2	4.8	2.5	3.9
Texas	10.5	11.3	8.6	7.5	7.7	6.4	6.5	6.3	9.7	4.2	5.1	3.3	5.1	4.4
Utah	6.4	2.5	1.6	3.6	4.9	3.7	6.2	4.4	3.0	1.8	1.6	1.1	2.3	2.2
Vermont	9.0	3.3	3.0	1.7	2.1	1.2	2.4	1.8	1.7	0.8	1.0	0.8	1.1	0.6
Virginia	4.5	3.5	3.0	2.4	2.2	1.8	2.4	2.0	1.6	1.5	2.4	3.0	3.1	3.1
Washington	12.6	9.4	7.7	4.7	4.7	4.1	2.8	2.0	2.4	1.9	2.2	2.9	1.4	1.5
West Virginia	4.9	3.6	3.0	2.4	2.6	2.9	2.0	0.9	0.8	1.6	1.7	1.9	1.4	2.4
Wisconsin	9.1	9.6	9.6	6.3	1.9	1.6	1.7	10.7	9.7	0.6	0.8	0.9	0.9	0.9
Wyoming	5.1	7.2	4.7	7.2	5.0	6.8	9.2	5.1	2.2	2.8	0.6	0.6	3.4	6.2

Hepatitis C/NANB

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Alabama	0.6	0.6	0.4	0.1	0.5	0.1	0.2	0.3	0.1	0.0	0.2	0.1	0.2	0.1
Alaska	1.6	2.3	1.2	2.0	.	0.5	0.5	.	.	.	.	.	.	.
Arizona	2.0	0.5	0.9	0.3	0.7	1.3	1.7	0.5	0.4	1.0	0.4	0.2	0.1	0.1
Arkansas	0.8	0.2	0.2	0.2	0.3	0.3	0.3	0.6	1.1	1.2	0.4	0.6	0.4	0.1
California	2.1	1.3	3.4	1.8	1.8	1.6	1.5	2.7	2.6	0.6	0.3	0.3	0.2	0.1
Colorado	1.6	2.7	2.9	1.7	2.1	1.8	1.6	0.9	0.8	0.9	0.4	0.2	0.1	0.3
Connecticut	0.3	0.1	.	.	.	.	.	.	.	.	.	.	.	.
Delaware	1.3	0.7	29.4	0.1	0.3	.	0.1	.	.	.	0.3	1.4	.	.
District of Columbia	1.3	40.3	46.5	0.5	0.3	.	.	.	.	0.2	0.5	.	.	.
Florida	0.6	0.7	1.4	0.3	0.7	0.9	0.8	1.0	0.6	0.4	0.3	0.4	0.5	0.4
Georgia	0.2	1.5	2.0	6.5	3.1	0.4	.	.	0.1	0.0	0.0	.	0.7	0.1
Hawaii	1.7	1.6	14.7	0.3	0.4	10.4	18.0	15.0	4.4	.	0.2	.	0.1	0.3
Idaho	0.8	0.6	.	.	6.2	4.9	8.2	7.0	6.9	0.6	0.2	0.2	0.1	0.1
Illinois	0.7	0.9	1.0	0.9	0.7	0.7	0.8	0.7	0.3	0.4	0.2	0.1	0.2	0.2
Indiana	0.6	5.7	0.5	0.3	0.2	0.2	0.1	0.2	0.1	0.0	.	0.0	0.0	0.2
Iowa	0.5	0.4	0.2	0.3	0.5	0.5	1.8	1.0	0.3	.	0.1	.	0.0	0.0
Kansas	1.6	0.8	0.6	0.7	0.7	0.7	0.6	0.5	0.2	.	0.3	0.3	.	.
Kentucky	1.1	0.2	0.2	0.4	0.8	0.9	0.7	0.4	0.6	0.7	1.0	0.3	0.1	0.6
Louisiana	0.1	2.4	3.0	4.1	4.9	5.1	6.6	6.2	3.1	6.8	10.2	3.4	2.2	2.3
Maine	0.4	0.4	0.5	0.2	.	.	.	.	.	0.2	0.2	0.1	.	0.2
Maryland	0.9	1.0	0.7	0.8	0.4	0.1	0.1	0.2	0.4	0.4	0.3	0.2	0.3	0.2
Massachusetts	0.4	0.5	0.9	1.3	2.0	1.7	1.2	0.7	0.8	0.1	0.3	0.4	0.1	.
Michigan	0.5	1.5	5.1	4.2	2.1	2.5	3.6	4.0	4.8	8.3	2.0	1.4	0.9	1.0
Minnesota	0.8	0.4	0.6	0.3	0.4	0.1	0.2	0.1	0.4	0.5	0.3	0.7	0.3	0.5
Mississippi	0.6	0.4	0.0	0.4	.	.	5.6	4.0	3.0	6.9	10.7	3.8	3.2	1.5
Missouri	0.8	0.7	0.5	0.5	0.6	0.4	0.4	0.2	0.3	5.7	10.8	19.8	10.8	4.5
Montana	0.9	4.1	3.4	0.4	1.5	2.1	2.3	2.7	0.9	0.6	0.6	0.1	0.1	0.4
Nebraska	0.3	0.1	5.5	0.7	0.9	1.4	0.5	0.2	0.3	0.2	0.3	0.6	0.9	0.2
Nevada	2.6	2.4	1.1	1.4	1.3	1.6	1.3	1.1	1.1	0.5	0.9	0.6	1.4	1.2
New Hampshire	0.8	0.8	2.1	0.7	1.0	1.2	0.6	.	.	.	.	.	.	.
New Jersey	0.6	1.4	1.2	1.2	2.6	2.3	.	.	.	.	6.7	14.3	0.1	.
New Mexico	1.8	1.5	3.3	6.5	2.7	3.1	4.4	3.4	5.4	1.9	0.9	0.7	0.2	.
New York	0.7	1.4	1.1	1.4	1.3	1.8	1.5	1.5	0.7	0.4	0.2	0.2	0.3	0.1
North Carolina	2.2	1.7	1.3	1.1	0.8	0.9	0.6	0.7	0.3	0.4	0.2	0.3	0.3	0.2
North Dakota	0.3	0.8	0.6	0.5	0.2	1.1	.	0.6	.	0.2	0.2	.	.	.
Ohio	0.9	1.5	0.9	0.3	0.2	0.1	0.3	0.2	0.1	0.0	0.1	0.1	0.0	0.1
Oklahoma	0.9	1.5	1.5	1.5	1.9	1.6	0.2	0.3	0.7	0.5	0.5	0.2	0.6	0.2
Oregon	2.1	4.5	2.8	1.8	1.5	1.2	0.2	0.1	0.6	0.7	0.8	0.4	0.4	0.4
Pennsylvania	0.7	0.4	0.3	0.3	0.4	0.5	0.5	0.7	1.0	0.6	0.4	1.2	0.5	0.9
Rhode Island	.	1.2	0.7	1.3	2.0	0.8	0.6	0.8	0.4	0.3	0.7	.	0.1	0.1
South Carolina	0.4	1.1	0.0	0.1	0.3	0.6	0.9	1.0	0.5	0.6	0.1	0.3	0.1	0.6
South Dakota	0.6	0.1	.	.	.	0.1	.	.	.	.	.	.	0.1	.
Tennessee	3.1	9.6	25.1	19.3	17.1	18.5	7.4	4.4	3.1	2.2	2.0	1.2	0.5	0.4
Texas	0.9	0.8	1.6	2.3	1.7	1.8	1.1	1.9	2.3	1.8	1.3	2.3	1.3	0.2
Utah	1.6	1.4	2.0	2.2	0.9	0.6	0.9	0.2	1.0	0.3	0.6	0.1	0.2	.
Vermont	1.4	1.2	3.0	1.0	2.7	2.4	4.4	0.7	1.0	1.2	0.8	1.1	2.4	2.1
Virginia	0.7	0.6	0.7	0.8	0.4	0.3	0.3	0.4	0.2	0.2	0.0	0.0	0.2	0.2
Washington	2.9	3.3	3.6	4.1	5.5	4.3	1.2	0.7	0.5	0.4	0.7	0.5	0.4	0.3
West Virginia	0.2	0.2	0.4	2.4	2.6	2.4	0.5	1.0	0.5	1.2	1.3	1.4	0.2	1.1
Wisconsin	0.3	2.0	2.0	0.8	.	.	.	0.5	2.8	0.3	.	.	0.1	0.1
Wyoming	1.1	1.7	14.2	25.2	36.9	46.0	36.7	17.0	20.8	17.9	0.4	1.6	1.0	.

Acute Hepatitis A, 2003

Summary

With an average of 28,000 cases per year (range: 23,112-35,821) during 1987-1997, hepatitis A has historically been one of the most frequently reported notifiable diseases in the United States. However, effective vaccines to prevent hepatitis A virus (HAV) infection have been available in the U.S. since 1995 for use in individuals at least two years of age. These vaccines have provided the opportunity to substantially reduce disease incidence and potentially eliminate transmission.

Since 1996, hepatitis A vaccine has been recommended for individuals at increased risk of hepatitis A including international travelers, men who have sex with men, and injecting and non-injecting drug users [1]. In 1999, routine vaccination was also recommended for children living in 11 states, ten of which are in the western region, with average hepatitis A rates during 1987-1997 that were at least 20/100,000 and was suggested for children in an additional six states where rates were less than 20/100,000 but above 10/100,000 which was approximately the national average for the time period [2].

Hepatitis A rates have declined steadily since the issuance of these recommendations, with the most dramatic decreases occurring in the age groups and regions for which routine childhood vaccination is recommended, suggesting that this strategy is reducing the transmission of HAV in the United States. The overall rate in 2003 is the lowest yet recorded. The declines in rates that have been observed in recent years have also been accompanied by substantial shifts in the epidemiologic profile of this disease in the United States with an increasing proportion of cases occurring among adults, particularly those in high risk groups such as international travelers and men who have sex with men. Further monitoring of disease rates is needed to determine if the current low rates are sustained and attributable to vaccination and to identify groups and areas where additional vaccination efforts are needed.

- Historically, hepatitis A rates have varied cyclically with periodic nationwide increases. The national rate of hepatitis A has declined steadily since the last peak that occurred in 1995. With 7653 cases reported for the year 2003, the national incidence of hepatitis A is now the lowest yet recorded (2.6/100,000). Figure 3

- In addition to temporal variation, hepatitis A rates have consistently varied geographically with higher rates in the West than elsewhere in the country. Following the 1999 issuance of recommendations for routine childhood vaccination that focused on states with consistently elevated rates of hepatitis A, incidence rates in the West have declined steadily and since 2001 have been approximately equal to those in other regions of the U.S. Figure 4, Figure 5. In 2003, the increase in the rate in the Northeast was attributable to a single large food-borne outbreak in a Pennsylvania county which resulted in more than 500 cases of hepatitis A. The implicated food-product, imported green onions, was also linked to increased numbers of cases in Georgia and Tennessee.

- Incidence of hepatitis A varies by age. Since the last nationwide increase, rates have declined among all age groups but the greatest decreases have been among children. Historically, the highest rates have been among children and young adults with the lowest rates observed among persons greater than 40 years of age. However, since 1997, rates among children have declined more rapidly than among adults and in 2003, rates were similar for all age groups 5 years of age or older ranging from 2.3/100,000 among children 5-14 years to 3.1/100,000 among persons 25-39 years . Since 2001, the lowest rates have been among persons <5 years of age. However, asymptomatic infection is common among very young children and reported cases in children <5 represent only a small proportion of infections occurring in this age group. The low and relatively stable rates among persons 40+ years of age in large part reflect the higher proportion of persons in this age group with immunity due to previous infection; data from the Third National Health and Nutrition Examination Survey (NHANES III) conducted during 1988-1994 (CDC, unpublished data) indicated that approximately one third of the U.S. population have serologic evidence of immunity to HAV. Figure 6

- Rates of hepatitis A have historically been higher among males than females and during the late 1990s through 2001, the difference in the gender-specific rates increased until there were almost 2 male cases for each female case. However, since 2001, rates have declined more in males than females and the rates are now similar for both genders (2.8/100,000 for males vs. 2.4/100,0000 for females) Figure 7 Nevertheless, although overall rates are now similar for

males and females, the difference remains apparent for persons aged 30-49 where rates among males are 33-73% higher than for similarly aged females. Figure 8

- Historically, hepatitis A rates have differed by race with the highest rates among American Indian/Alaska Natives and the lowest rates among Asians and by ethnicity with higher rates among Hispanics than non-Hispanics. However, rates among American Indians which were greater than 60/100,000 prior to 1995 have decreased dramatically following widespread vaccination in this group and in 2003, are approximately the same or lower than those in other races. Rates among Hispanics have also decreased since 1997 but remain higher than those for Non-Hispanics. Figure 9

- Among cases where information about exposures during the incubation period was determined, the most frequently identified risk factor for hepatitis A in 2003 was common-source outbreaks which was reported by 16% of cases up from an average of 4% during the previous 5 years. Many of these outbreak-associated cases were part of a group of related outbreaks in Pennsylvania, Tennessee and Georgia associated with the consumption of contaminated green onions. International travel was also a commonly identified risk factor reported by approximately 11% of cases overall and by more than 25% of cases <15 years of age. 75% of these travel-related cases were associated with travel to Central/South America including Mexico while 12% reported travel to Asia/South Pacific, 6% to Africa and 10% to the Middle East. The percentage of cases reporting sexual and household contact with another hepatitis A case which has historically always been among the most frequently identified risk factors was smaller than previous years but still was reported by approximately 11% of cases. Similarly, of all cases reported, the proportion (and also the absolute number) reporting male homosexual behavior which, since 1999, has been reported by 14-23% of cases declined to 10%. When calculated for male cases only, 16% reported homosexual behavior. The proportion of cases in persons reporting illegal drug use was 7% in 2003 which is similar to previous years. Table 4, Figure 10

- The clinical characteristics of hepatitis A cases reported in 2003 are similar to previous years with 80% of cases having jaundice, 25% requiring hospitalization for their illness and 0.6%

resulting in death. The proportion of cases that were jaundiced was highest in persons 5-39 years of age (86%) and lowest among persons older than 60 years (58%). The proportion of cases hospitalized increased with age from 14% among children <5 years of age to 45% among persons 60 years of age or older. Table 5

Figure 3: Incidence of Reported Hepatitis A, United States, 1966-2003

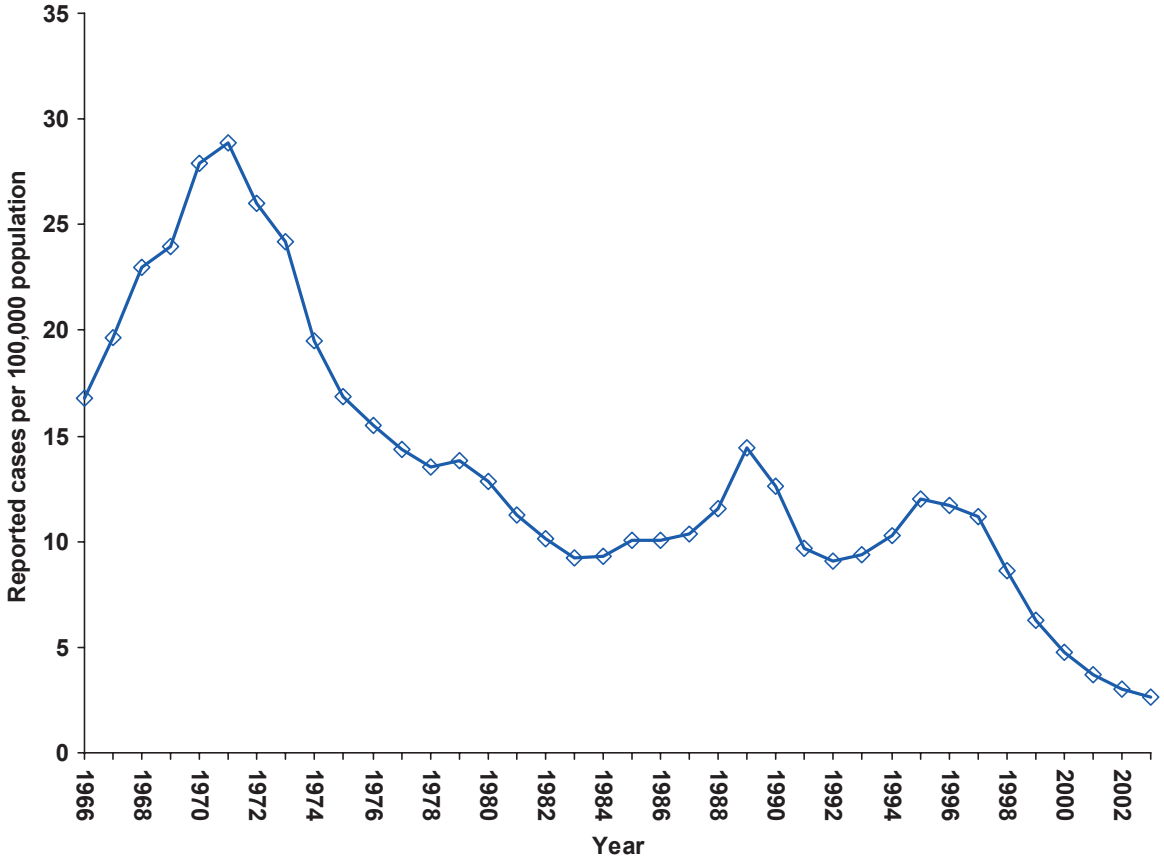
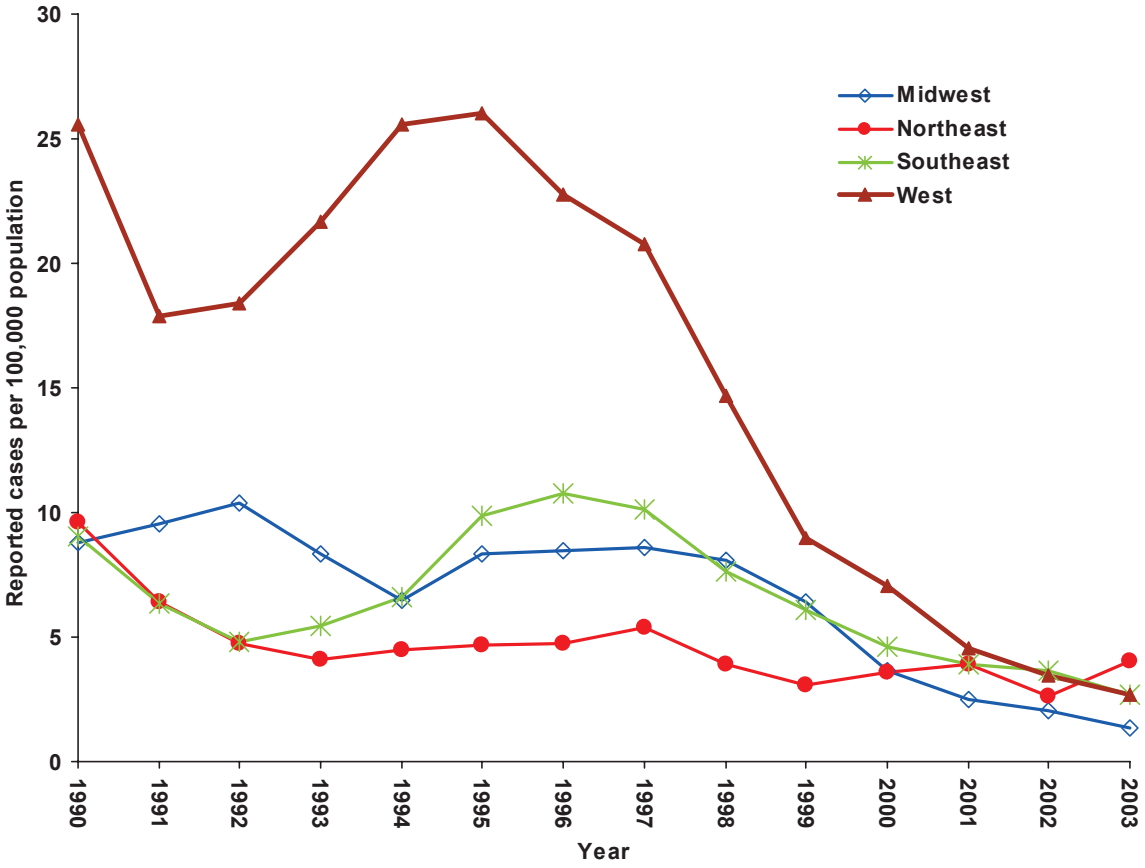
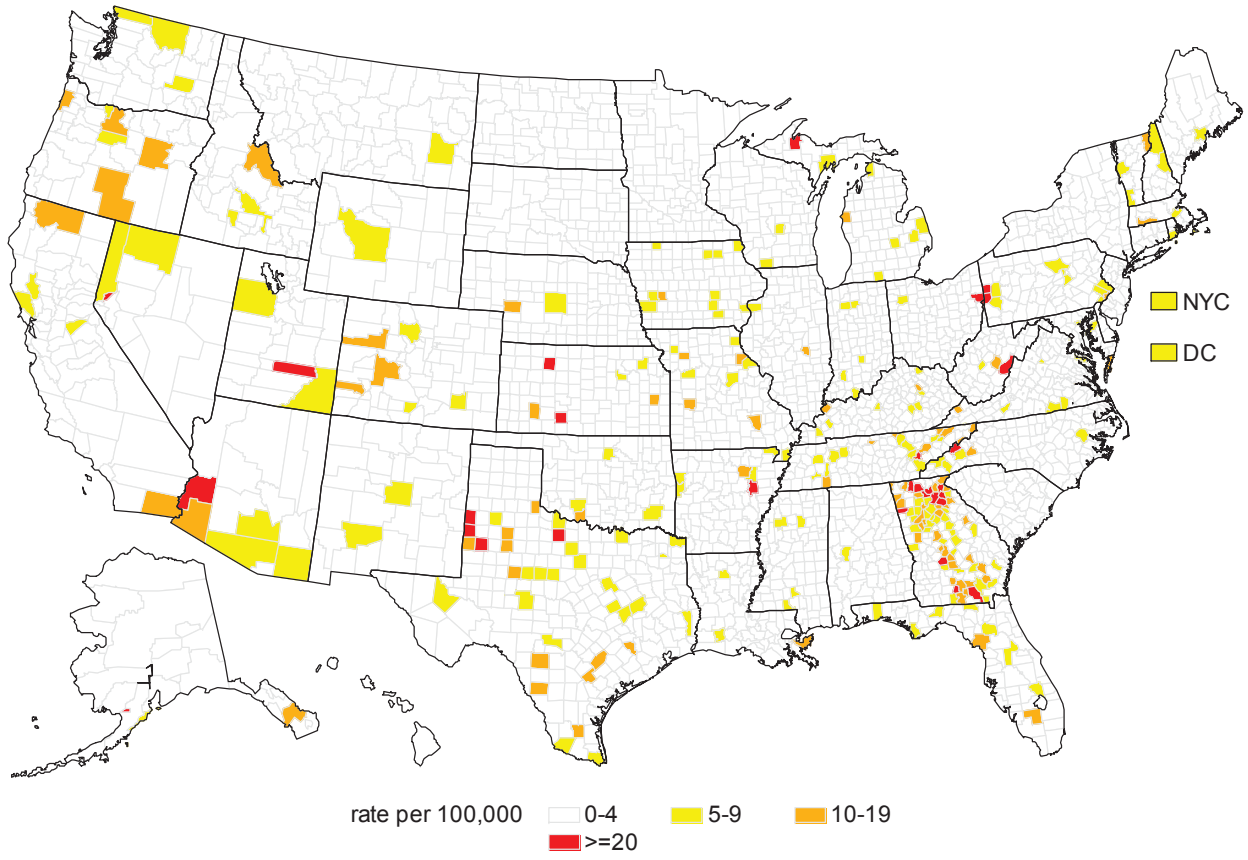


Figure 4: Incidence of Reported Hepatitis A, by Region, United States, 1975-2003



See page 5 for regional categories

Figure 5: Incidence of Reported Hepatitis A, by County, United States, 2003



Source: NNDSS

Figure 6: Incidence of Reported Hepatitis A, by Age, United States, 1990-2003

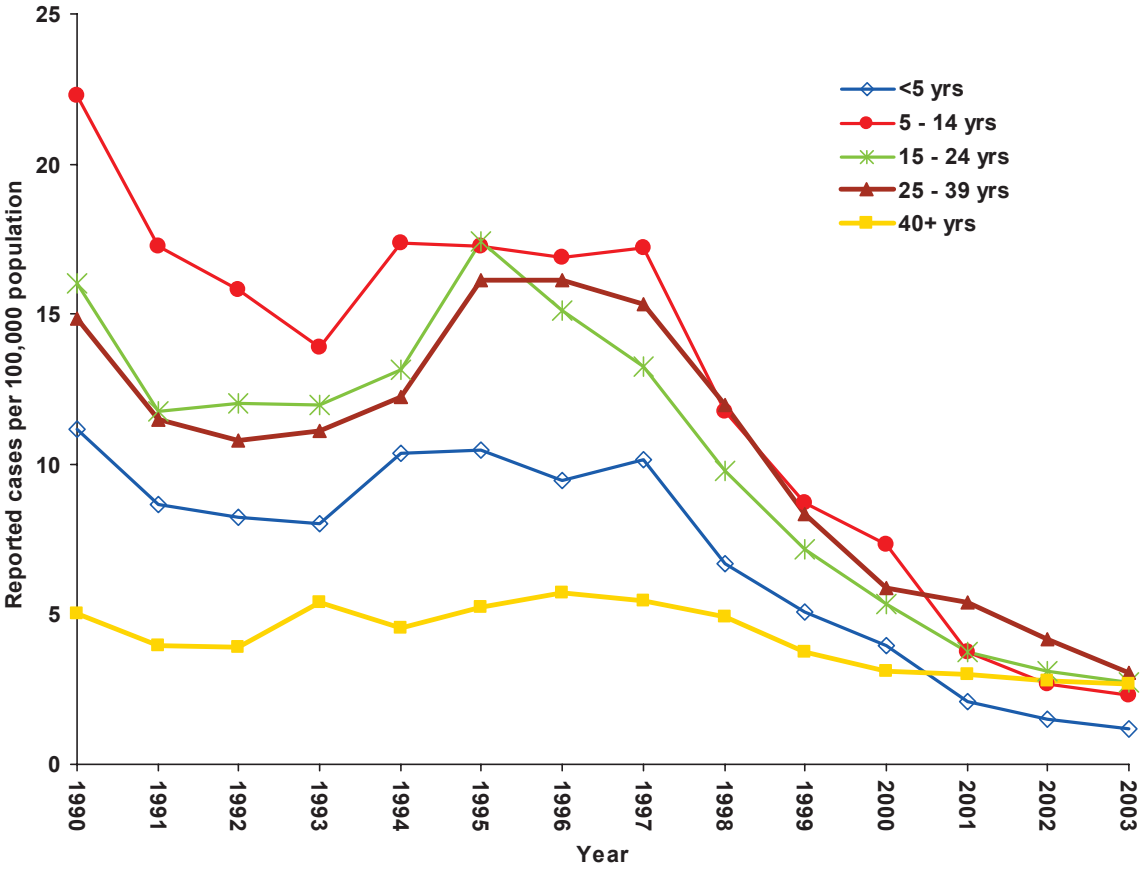
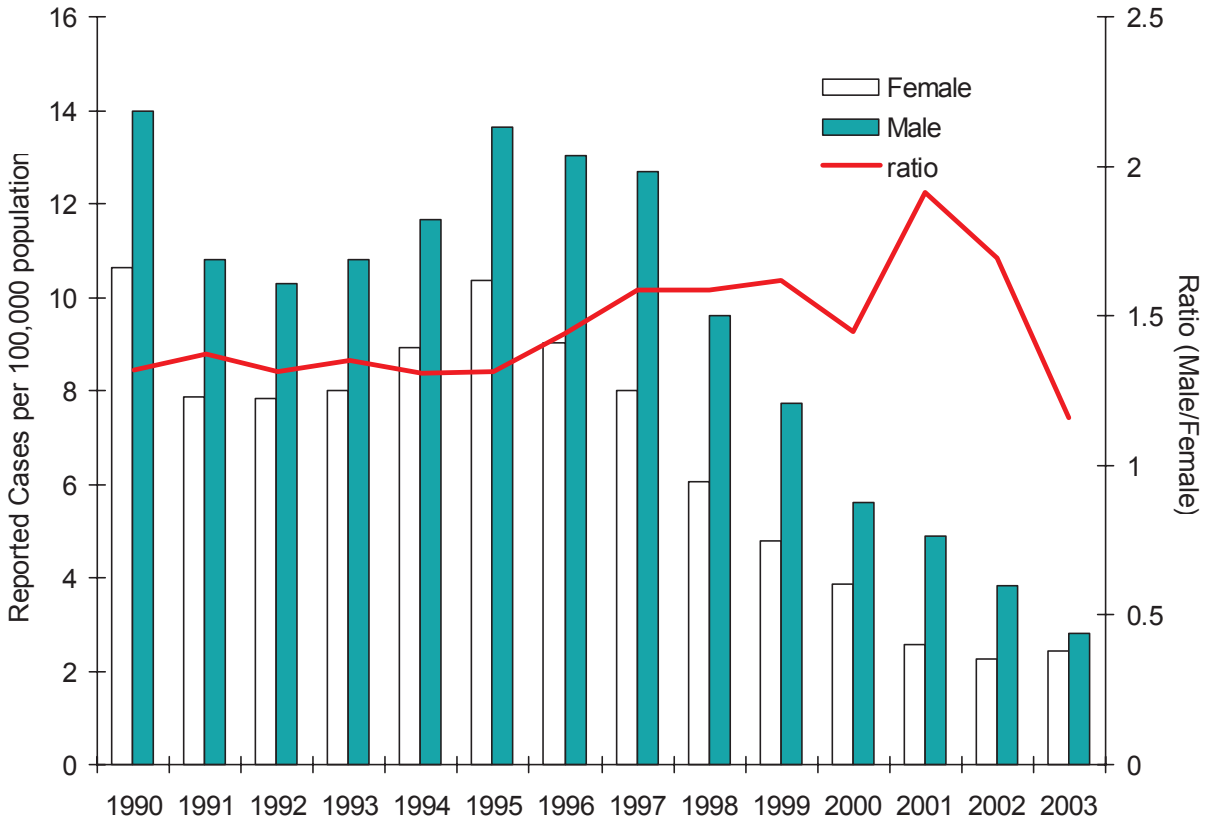
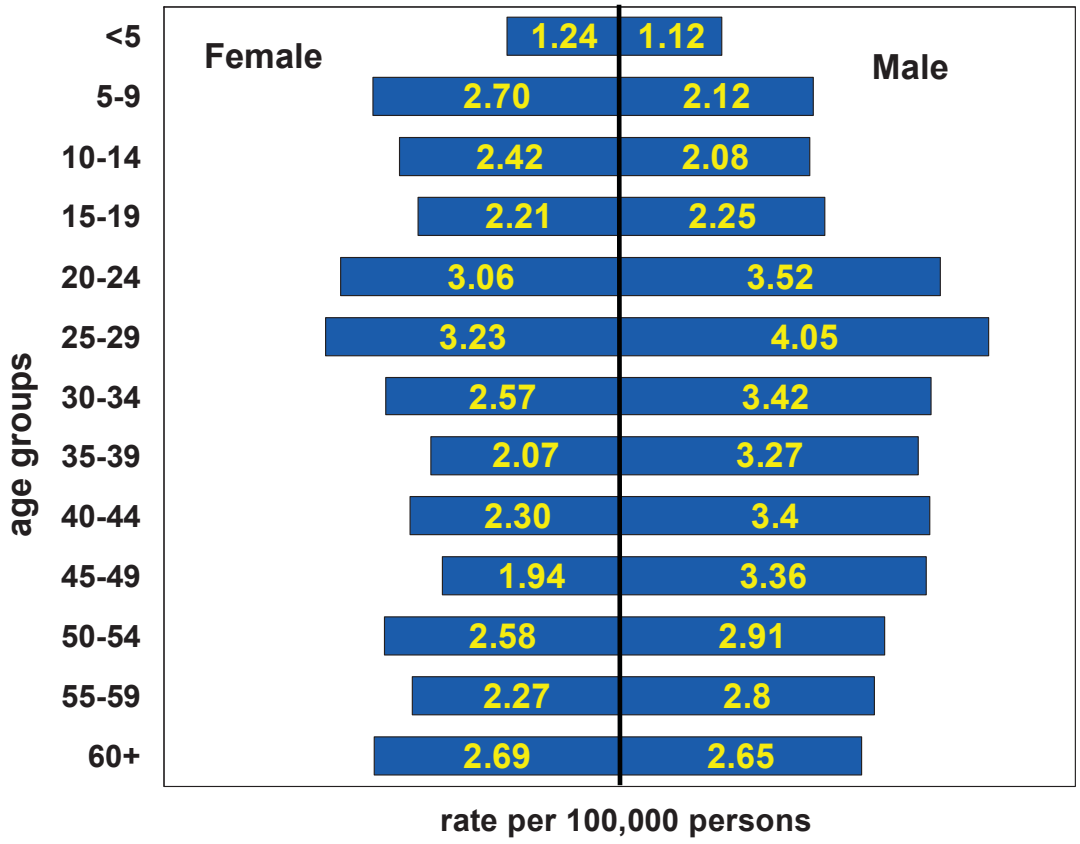


Figure 7: Incidence of Reported Hepatitis A, by Sex, United States, 1990-2003



Note: The bars indicate the rate per 100,000 (the left y-axis) by gender; the line is the ratio (right y-axis) of the incidence rate among males to that among females.

Figure 8: Incidence of Reported Hepatitis A, by Age and Sex, United States, 2003



* A total of 7653 cases of Hepatitis A were reported. However, rates exclude patients with missing data for age and sex.

Figure 9: Incidence of Reported Hepatitis A, by Race and Ethnicity, United States, 1990-2003

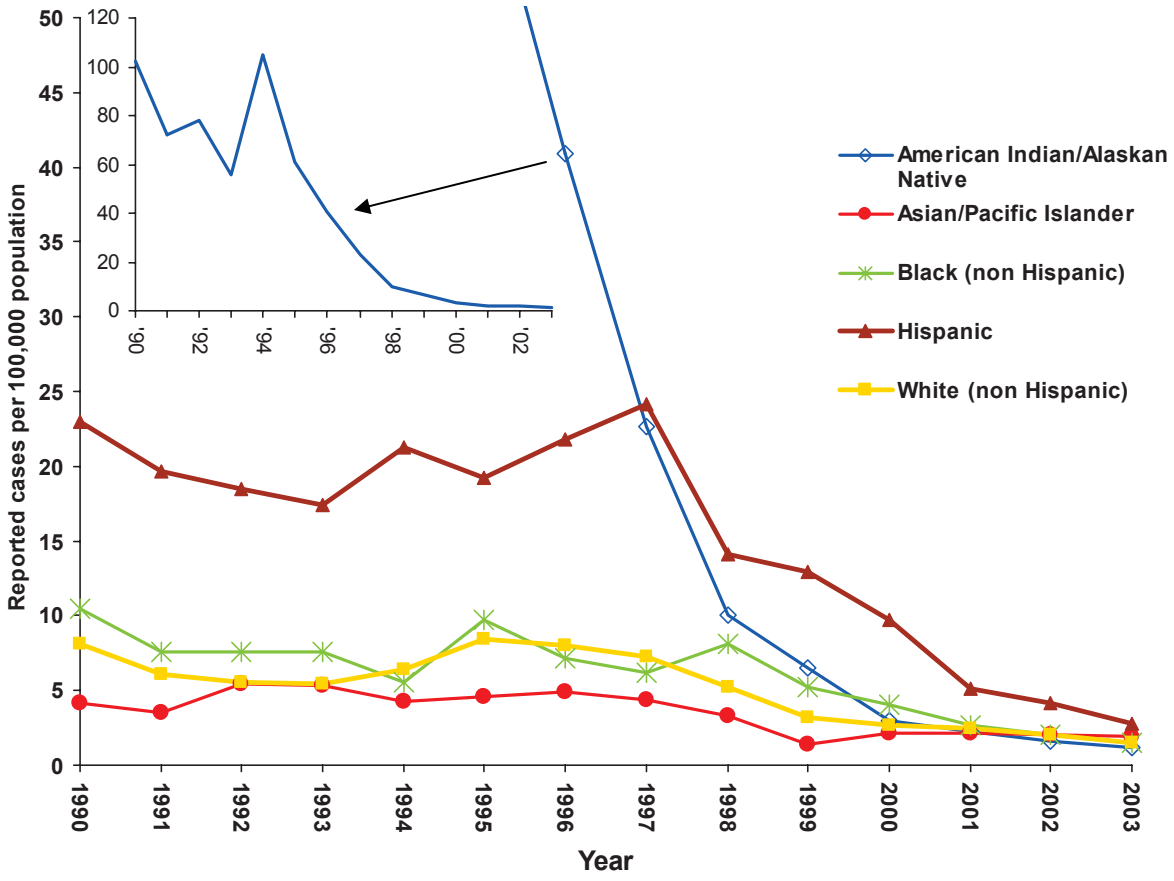
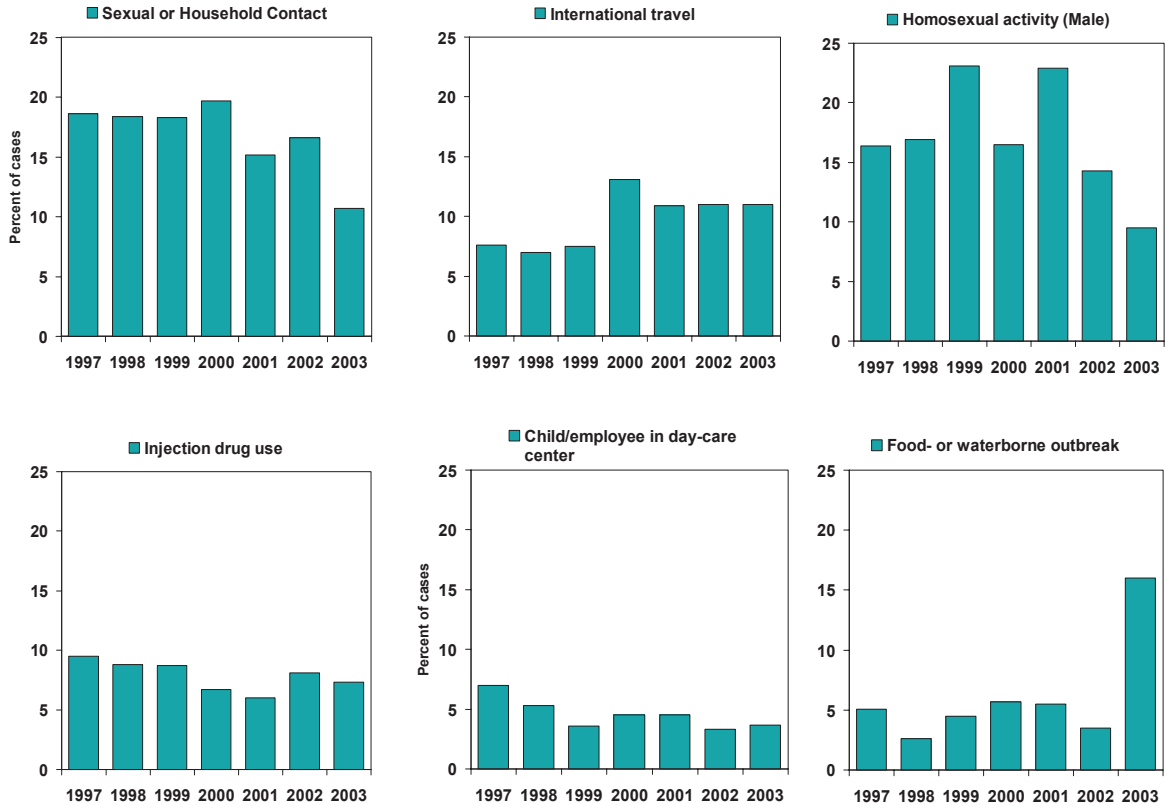


Table 4: Epidemiologic Characteristics of Patients Reported with Hepatitis A, by Age, United States, 2003

Exposure during the 2-6 weeks prior to illness onset	Age Groups											
	<15			15-39			40+			Total		
	n	N	%	n	N	%	n	N	%	n	N	%
Sexual or Household Contact	79	378	20.9	104	1,042	10.0	76	998	7.6	259	2,418	10.7
International travel	122	440	27.7	118	1,155	10.2	60	1,103	5.4	300	2,698	11.1
Male Homosexual activity ‡	1	21	4.8	39	402	9.7	34	358	9.5	74	781	9.5
Injection drug use	2	264	0.8	95	672	14.1	19	652	2.9	116	1,588	7.3
Child/employee in day-care center	52	435	12.0	29	1,170	2.5	22	1,144	1.9	103	2,749	3.7
Suspected food- or waterborne outbreak	52	316	16.5	159	744	21.4	85	790	10.8	296	1,850	16.0
Contact of day-care child/employee	35	412	8.5	63	1,106	5.7	38	1,072	3.5	136	2,590	5.3
Other Contact with hepatitis A patient¥	65	378	17.2	137	1,042	13.1	61	998	6.1	263	2,418	10.9
No risk factor identified	192	488	39.3	678	1,295	52.4	915	1,249	73.3	1,785	3,032	58.9
No risk factor data submitted	.	679	.	.	1,699	.	.	2,126	.	.	4,504	.
TOTAL	.	1,167	.	.	2,994	.	.	3,375	.	.	7,536	.

‡ When calculated for male cases only, 16% reported homosexual behavior.
¥ Examples of other contact include playmate, drug sharing contact, or careprovider.

Figure 10: Trends in Selected Epidemiologic Characteristics among Patients Reported with Hepatitis A, by Year, United States, 1996-2003



Note: The percentage of cases reporting a specific risk factor was calculated based on the total number of cases reporting any information for that exposure. Multiple risk factors can be reported for a single case.

Table 5 : Clinical Characteristics of Patients Reported with Hepatitis A, By Age, United States, 2003

	<5 yrs			5-14 yrs			15-39 yrs			40-59 yrs			60+ yrs			All		
	n	N	%	n	N	%	N	N	%	n	N	%	n	N	%	n	N	%
Died From Hepatitis	0	85	0.0	2	341	0.6	1	1,133	0.1	6	713	0.8	6	397	1.5	15	2,669	0.6
Hospitalized for Hepatitis	11	79	13.9	74	332	22.3	342	1,117	30.6	228	692	32.9	172	382	45.0	827	2,602	31.8
Jaundice	54	80	67.5	319	367	86.9	1,058	1,244	85.0	635	785	80.9	216	373	57.9	2,282	2,849	80.1

A total of 7653 cases of hepatitis A including 15 deaths were reported. Percentages are calculated based upon the number of cases reported with non-missing data for age, and for outcome of interest (i.e. jaundice, hospitalization or death)

Acute Hepatitis B, 2003
Summary

During the past decade, a comprehensive strategy was developed and implemented for achieving the elimination of HBV transmission in the United States [3]. The primary elements of this strategy are: the screening of all pregnant women for HBV infection with the provision of post-exposure prophylaxis to infants born to infected women; the routine vaccination of all infants and children <19 years; and the targeted vaccination of individuals at increased risk of hepatitis B including health care workers, dialysis patients, household contacts and sex partners of persons with chronic HBV infection, recipients of certain blood products, persons with a recent history of having had multiple sex partners or a STD, men who have sex with men, and injecting drug users.

As highlighted below, the incidence of hepatitis B has declined dramatically since implementation of the strategy, particularly among the younger age groups covered by the recommendation for routine childhood immunization. However, high rates of disease continue among adults, particularly males 25-39 years of age, and the high proportion of cases occurring among persons in identified risk groups (i.e. injection drug users, men who have sex with men and persons with multiple sex partners) indicate a need to strengthen efforts to reach these populations with vaccine.

- With 7,526 cases reported nationwide, the overall incidence rate of reported acute hepatitis B in 2003 was 2.6/100,000. This is the lowest rate yet recorded and represents a decline of more than 75% since 1985 when incidence peaked at 11.5/100,000. However, the decline in rates has slowed and since 1999, the overall rate has changed by only 7%. Figure 11

- For the past decade, hepatitis B rates have been similar for all U.S. regions with rates in the West and Southeast only slightly higher than in the Northeast and Midwest (Figure 12, Figure 13). In 2003, rates were similar in the West, Midwest and Northeast but remained higher in the Southeast.

- Hepatitis B rates vary by age with the highest rates reported among persons 25-39 years of age (5.1/100,000 persons) and the lowest among persons less than 15 years of age (0.1/100,000). Rates have declined in all age groups with the greatest percent decline since 1990 occurring among children <15 years of age (95%) and young adults 15-24 years of age (83% decline). Although less dramatic than the declines in the younger age groups, most of which are covered by the recommendations for routine hepatitis B vaccination, there have also been substantial decreases in the hepatitis B rates among older persons with a 67% and 43% decrease in rates observed for 25-39 year olds and 40+ year old categories respectively. Figure 14

- As in previous years, the rate of acute hepatitis B in males (3.2/100,000) continues to be higher than in females (2.0/100,000). The ratio of cases occurring among males to those occurring among females increased from 1990 to 2001 and although it has dropped slightly since then, the rate in males is remains 1.6 times higher than in females. (Figure 15). This difference in hepatitis B rates by sex occurs only in persons more than 19 years of age and is greatest in persons more than 45 years of age where the ratio of male/female cases is approximately 2.0. Figure 15, Figure 16

- Rates of hepatitis B continue to decline among all racial and ethnic groups. Figure 17 Rates of hepatitis B remain highest among non-Hispanic blacks (3.5/100,000) and are now lowest (1.1/100,000) among Hispanics whose rates in 2003 dropped below that of non-Hispanic whites for the first time. The downward trend in the rate among Asians/Pacific Islanders continues and in 2003, the rate in this group is approaching the rate among non-Hispanic whites.

- Among cases for which information about exposures during the incubation period were determined, 36% of cases reported at least one sexual risk factor (11% reported sexual contact a known hepatitis B case, 30% multiple sexual partners, and 13% male homosexual activity). Injecting drug use was reported by 18% of cases. Receiving hemodialysis or a blood transfusion, both of which were previously major sources of infection, were reported by only 0.7% and 0.4% of cases respectively, presumably as a result of the vaccination of dialysis patients, improvements in infection control and the required screening of donated blood for markers of HBV infection. Similarly, the percentage of cases where occupational

exposure to blood is now approximately 0.5% following widespread hepatitis B vaccination of health care workers. Table 6, Figure 18

- Among cases of hepatitis B cases reported in 2003, 79% had jaundice, 40% were hospitalized because of their illness and 1.3% resulted in death. The proportion of cases that were jaundiced was approximately 79% in persons 5 years of age or older ranging from 67% among persons 5-14 years of age to 82% among persons 15-39 years of age; less than 25% of cases occurring in children less than 5 years of age presented with jaundice (warning: number of cases in this age group extremely small). The proportion of cases hospitalized increased with age from 25% among children <5 years of age to 45% among persons 60 years of age or older. Table 7

Figure 11: Incidence of Reported Acute Hepatitis B, United States, 1966-2003

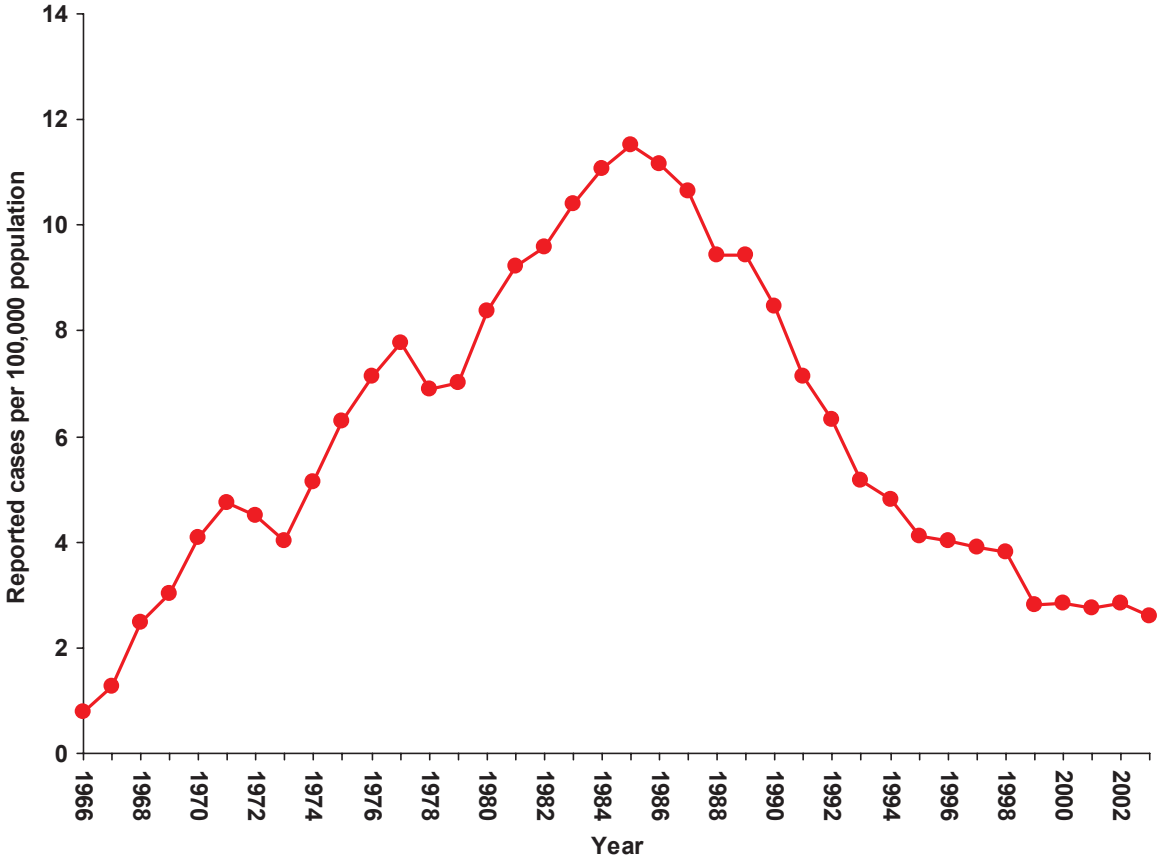
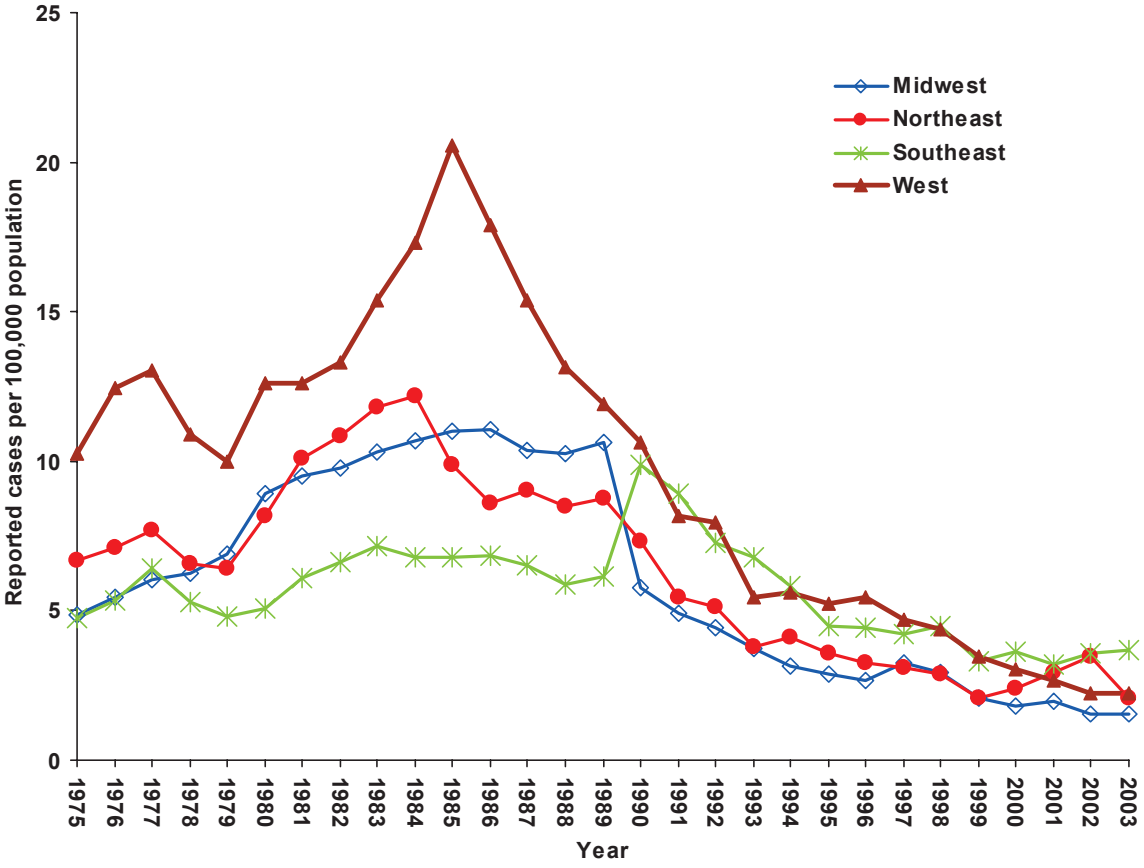
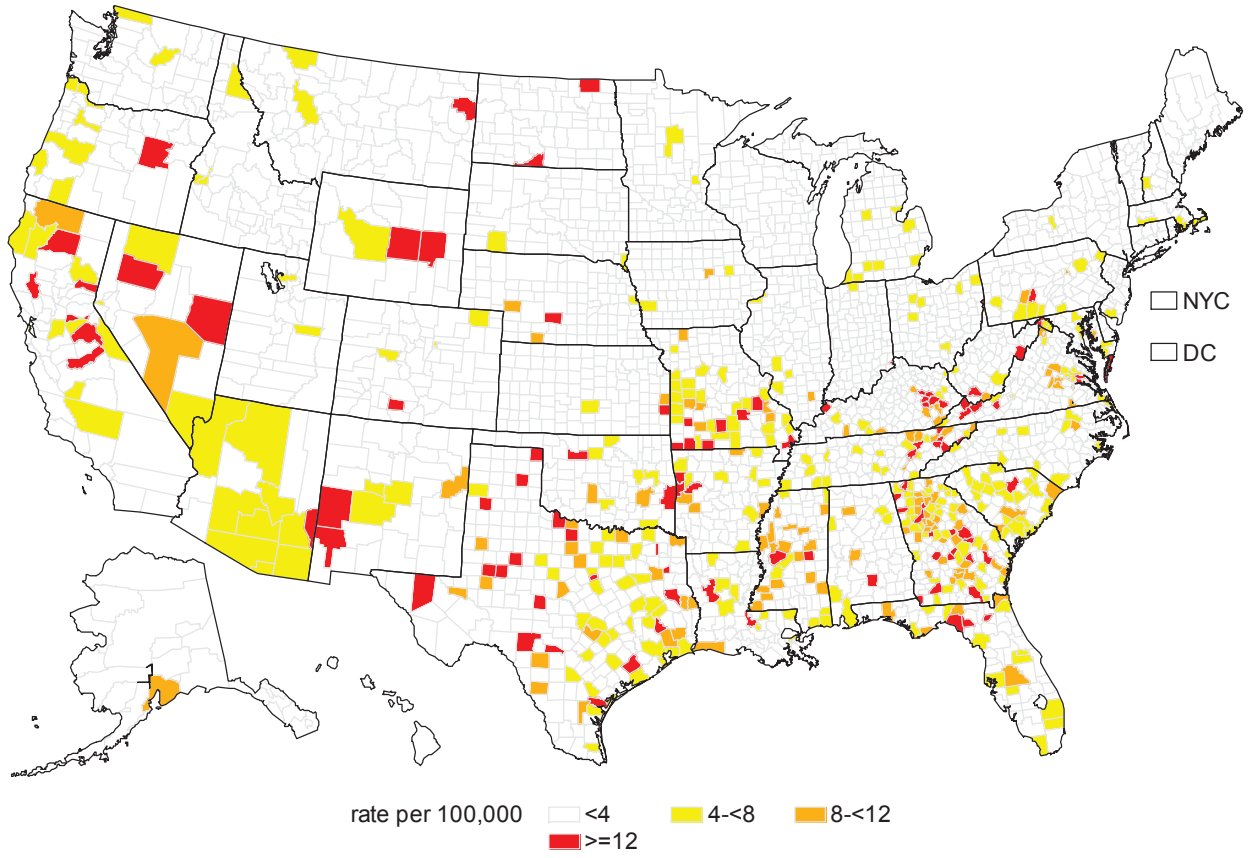


Figure 12: Incidence of Reported Acute Hepatitis B, by Region, United States, 1975-2003



See page 5 for regional categories

Figure 13: Incidence of Reported Acute Hepatitis B, by County, United States, 2003



Source: NNDSS

Figure 14: Incidence of Reported Acute Hepatitis B, by Age, United States, 1990-2003

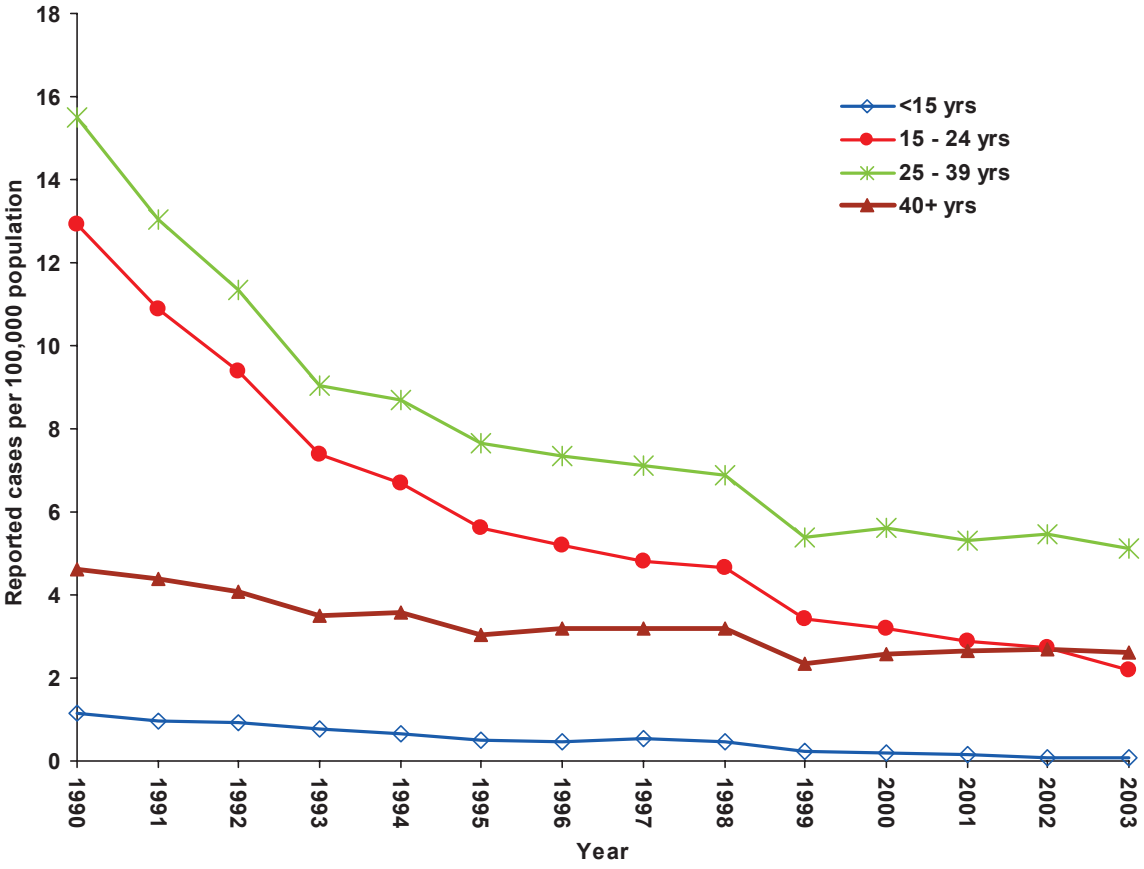
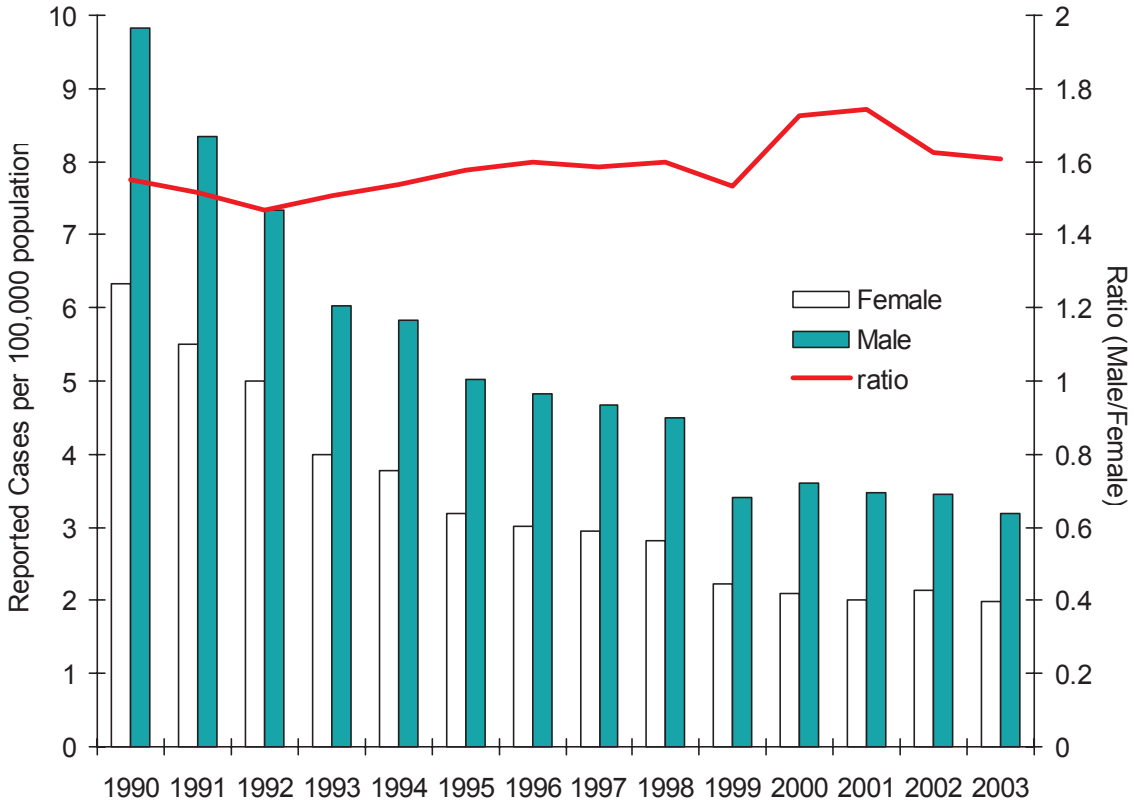


Figure 15: Incidence of Reported Acute Hepatitis B, by Sex, United States, 1990-2003



Note: The bars indicate the rate per 100,000 (the left y-axis) by gender; the line is the ratio (right y-axis) of the incidence rate among males to that among females

Figure 16: Incidence of Reported Acute Hepatitis B, by Age and Sex, United States, 2003

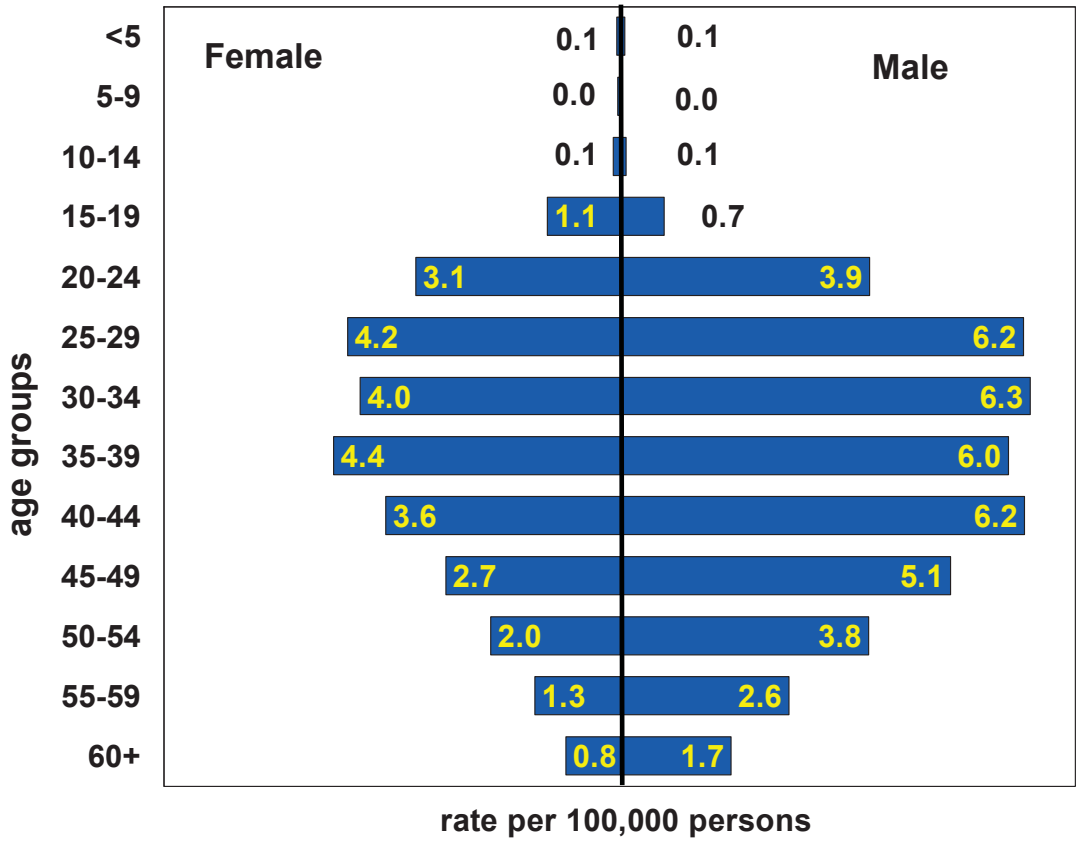


Figure 17: Incidence of Reported Acute Hepatitis B, by Race and Ethnicity, United States, 1990-2003

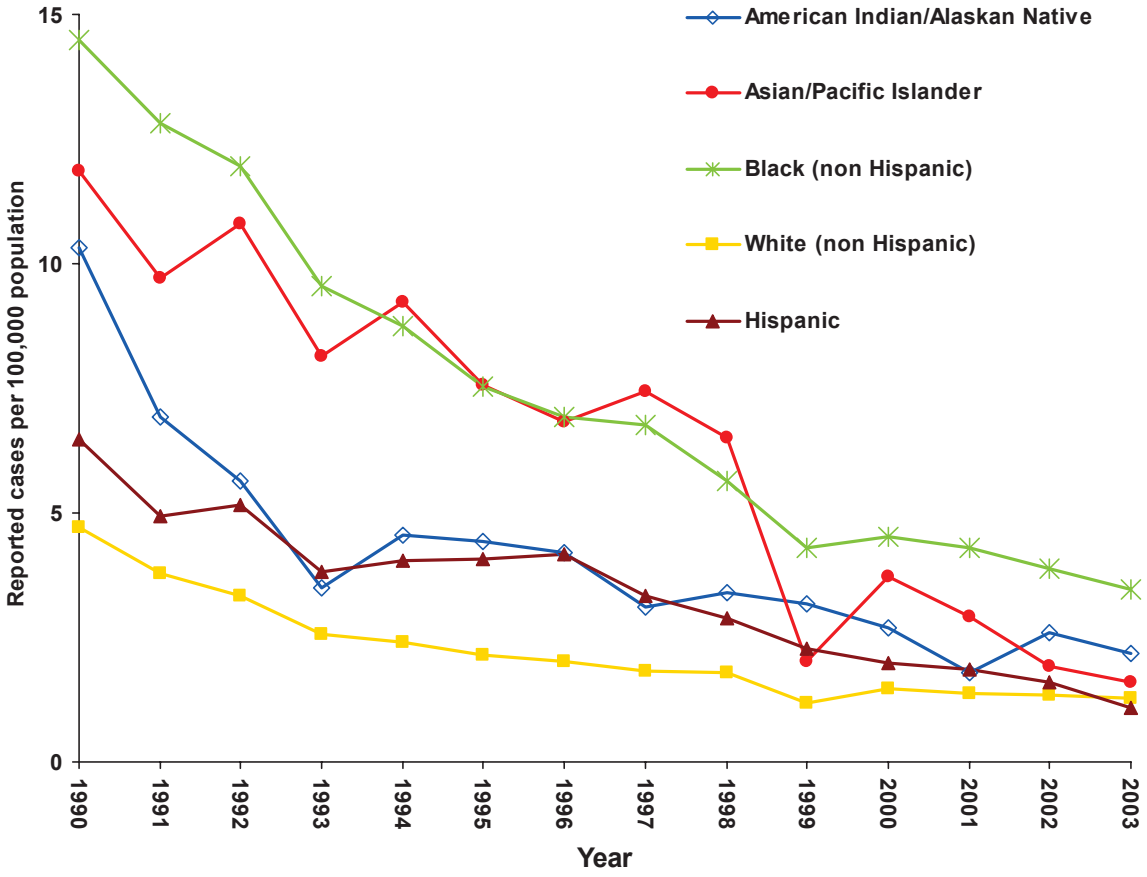


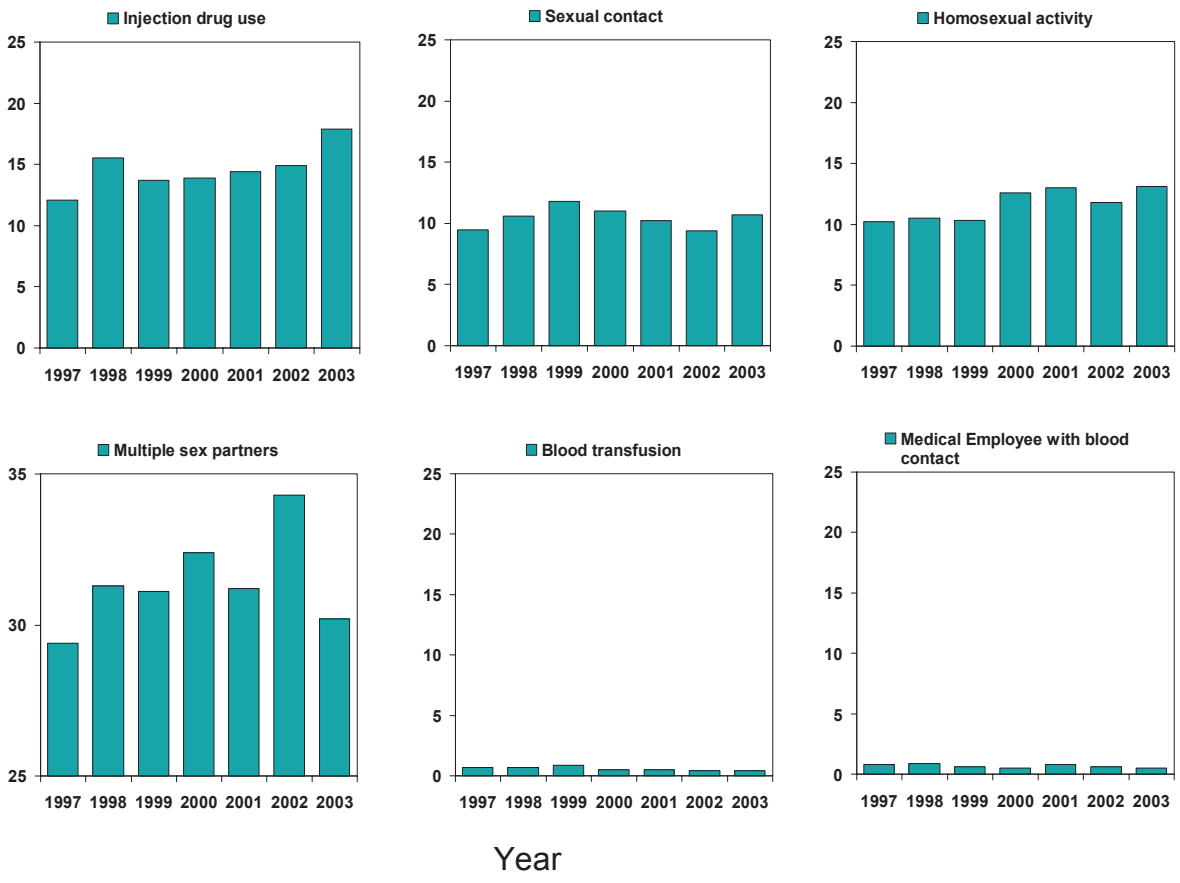
Table 6: Epidemiologic Characteristics of Patients Reported with Acute Hepatitis B, by Age, United States, 2003

Exposure during the 6 weeks-6 months before illness onset	Age Groups								
	<40*			40+			Total		
	n	N	%	n	N	%	n	N	%
Injection drug use	254	1,135	22.4	110	895	12.3	364	2,030	17.9
Sexual contact with hepatitis B patient	85	842	10.1	79	689	11.5	164	1,531	10.7
Household contact of hepatitis B patient	27	842	3.2	17	689	2.5	44	1,531	2.9
Male homosexual activity§	120	819	14.7	61	565	10.8	181	1,384	13.1
Medical Employee with contact with Blood	5	1,136	0.4	6	917	0.7	11	2,053	0.5
Hemodialysis	.	893	.	10	624	1.6	10	1,517	0.7
More than one sex partner	364	1,006	36.2	186	813	22.9	550	1,819	30.2
Heterosexual	321	909	35.3	170	764	22.3	491	1,673	29.3
Male homosexual or bisexual	43	97	44.3	16	49	32.7	59	146	40.4
Blood transfusion	1	1,124	0.1	7	884	0.8	8	2,008	0.4
Surgery	67	1,072	6.3	79	879	9.0	146	1,951	7.5
Percutaneous injury	29	992	2.9	40	802	5.0	69	1,794	3.8
No risk factor identified	645	1,342	48.1	601	1,053	57.1	1,246	2,395	52.0
No risk factor data	.	2,729	.	.	2,301	.	.	5,030	.
TOTAL	.	4,071	.	.	3,354	.	.	7,425	.

***** 151 (4%) of these cases were <19 years of age

§When determined for male cases only, 22% reported homosexual or bisexual behavior and in male cases <40 years of age, the proportion was 26%

Figure 18: Trends in Selected Epidemiologic Characteristics among Patients Reported with Acute Hepatitis B, by Year, United States



Note: The percentage of cases reporting a specific risk factor was calculated based on the total number of cases reporting any information for that exposure. Multiple risk factors can be reported for a single case.

Table 7: Clinical Characteristics of Patients Reported with Acute Hepatitis B, by Age, United States, 2003

	<5			5-14			15-39			40-59			60+			All		
	n	N	%	n	N	%	n	N	%	n	N	%	n	N	%	n	N	%
Died From Hepatitis	0	4	0.0	0	11	0.0	14	1,556	0.9	9	1,012	0.9	12	194	6.2	35	2,777	1.3
Hospitalized for Hepatitis	1	4	25.0	4	11	36.4	593	1,491	39.8	367	967	38.0	91	201	45.3	1,056	2,674	39.5
Jaundice	1	5	20.0	6	9	66.7	1,205	1,473	81.8	695	914	76.0	129	178	72.5	2,036	2,579	78.9

Note: A total of 7526 cases of Hepatitis B including 35 deaths were reported. Percentages are calculated based upon the number of cases reported with non-missing data for age, and for outcome of interest (i.e. jaundice, hospitalization or death).

Acute Hepatitis C/NANB Hepatitis, 2003

Summary

With an estimated 2.7 million chronically infected persons nationwide[4], hepatitis C virus (HCV) infection is the most common chronic bloodborne infection in the United States. No effective vaccine against this infection is available. National recommendations for prevention and control of HCV infection[5] issued in 1998 rely on primary prevention activities to reduce the risk for HCV transmission. These activities include: screening and testing of blood donors, viral inactivation of plasma-derived products, risk-reduction counseling and services, and implementation and maintenance of infection control practices.

Incidence of hepatitis C has been declining since the late 1980s. This decline is largely the result of a decrease in cases reported among injecting drug users (IDU) , the reasons for which are unknown. The majority of hepatitis C cases continue to occur in adult age groups (persons >25 years of age) with injecting drug use the most commonly identified risk factor for infection. Transmission of HCV associated with transfusion, an important risk factor for infection in the past, is now rare. Ongoing surveillance is needed to ensure that any new cases of hepatitis C are identified and investigated to determine the source of infection and limit further spread of the virus.

- 1150 cases of acute hepatitis C were reported in 2003. However, 259 (23%) of these were reported from a single state, Missouri; these reports were made on the basis of laboratory reports alone and the majority of them represent chronic rather than acute infection. Thus, all analyses excluded reports from Missouri. Based on the 891 cases reported by all other states, the overall national rate of reported acute hepatitis C was 0.4 per 100,000. Figure 19

- Rates have been declining in all age groups since the mid-1990s. The greatest decline in incidence has been among 25-39 year olds which has historically been the age group with the highest rates of disease. In this age group, incidence has declined by 90% since 1992 to 0.5/100,000 in 2003. Few cases are reported in persons <15 years of age. Figure 20

- As in previous years, the rate of hepatitis C in 2003 is higher among males (0.4 per 100,000) than among females (0.3 /100,000) but this differential has declined gradually over the

decade and is now the smallest it has ever been. In 2003, this difference in hepatitis C rates by sex is evident only in persons 20 years of age and older. Figure 21, Figure 22

- Incidence of hepatitis C varies by race and ethnicity. Rates have declined in all racial groups since 1995. In 2003, the rates are increasingly similar across racial/ethnic groups and range from 0.3/100,000 among non-Hispanic whites, non-Hispanic blacks and American Indian/Alaska Natives to 0.1/100,000 among Asian/Pacific Islanders. Hispanics who historically have had rates higher than among non-Hispanic whites (but lower than for non-Hispanic blacks) have since 2000 have had rates lower than for any other racial/ethnic group except Asian or Pacific Islanders. Figure 23

- Among cases for which information about exposures during the incubation period was determined, the most common risk factor for hepatitis C in 2003 was injection drug use. The proportion of cases reporting injection drug use has increased over the past decade from 31% in 1994 to 38% in 1999 to 45% in 2003. Another 14% reported sexual contact with a known case and 25% of cases reported having had multiple sexual partners during the incubation period. 2% of cases reported occupational exposure to blood. A history of transfusion or dialysis, both of which were previously important sources of HCV infection are now reported by only 0.4% and 1.5% of cases respectively. Table 8

Figure 19: Incidence of Reported Acute Hepatitis C/NANB, United States, 1992-2003

Figure 20: Incidence of Reported Acute Hepatitis C/NANB, by Age, United States, 1992-2003

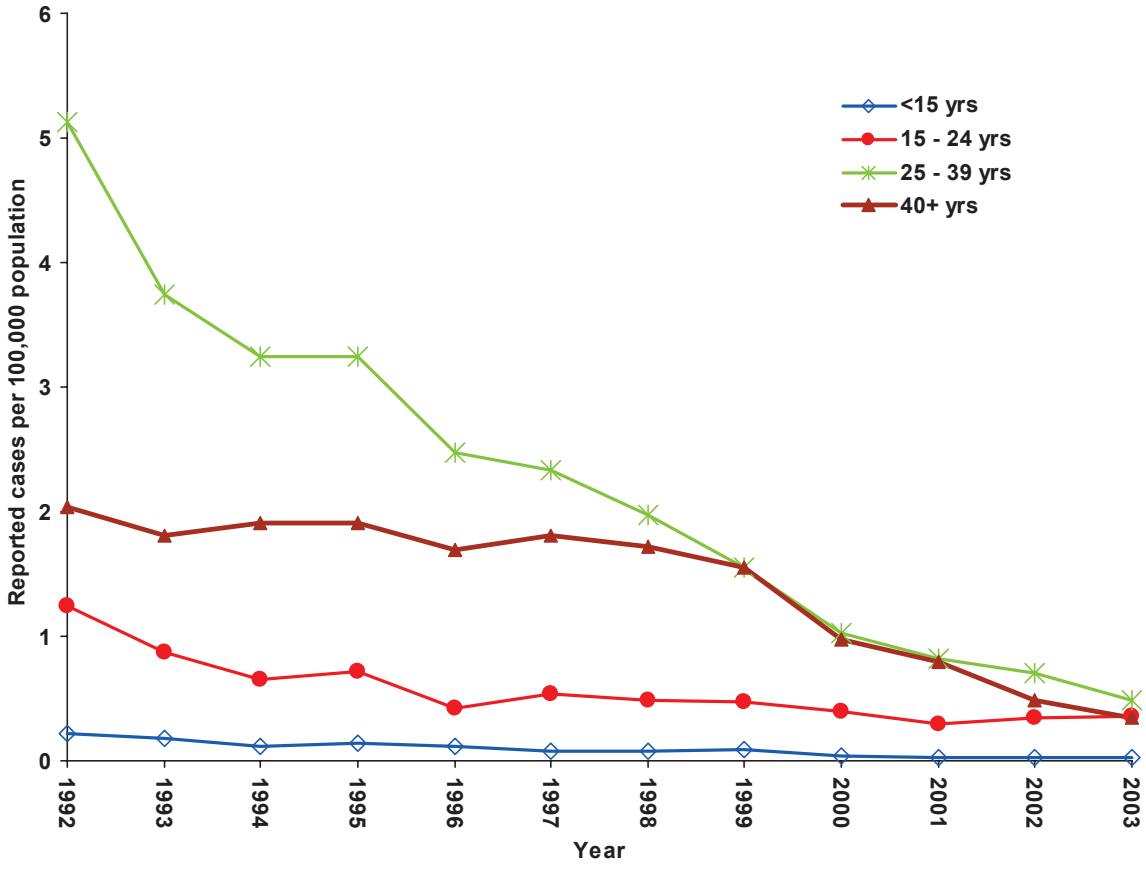


Figure 21: Incidence of Reported Acute Hepatitis C/NANB, by Sex, United States, 1992-2003

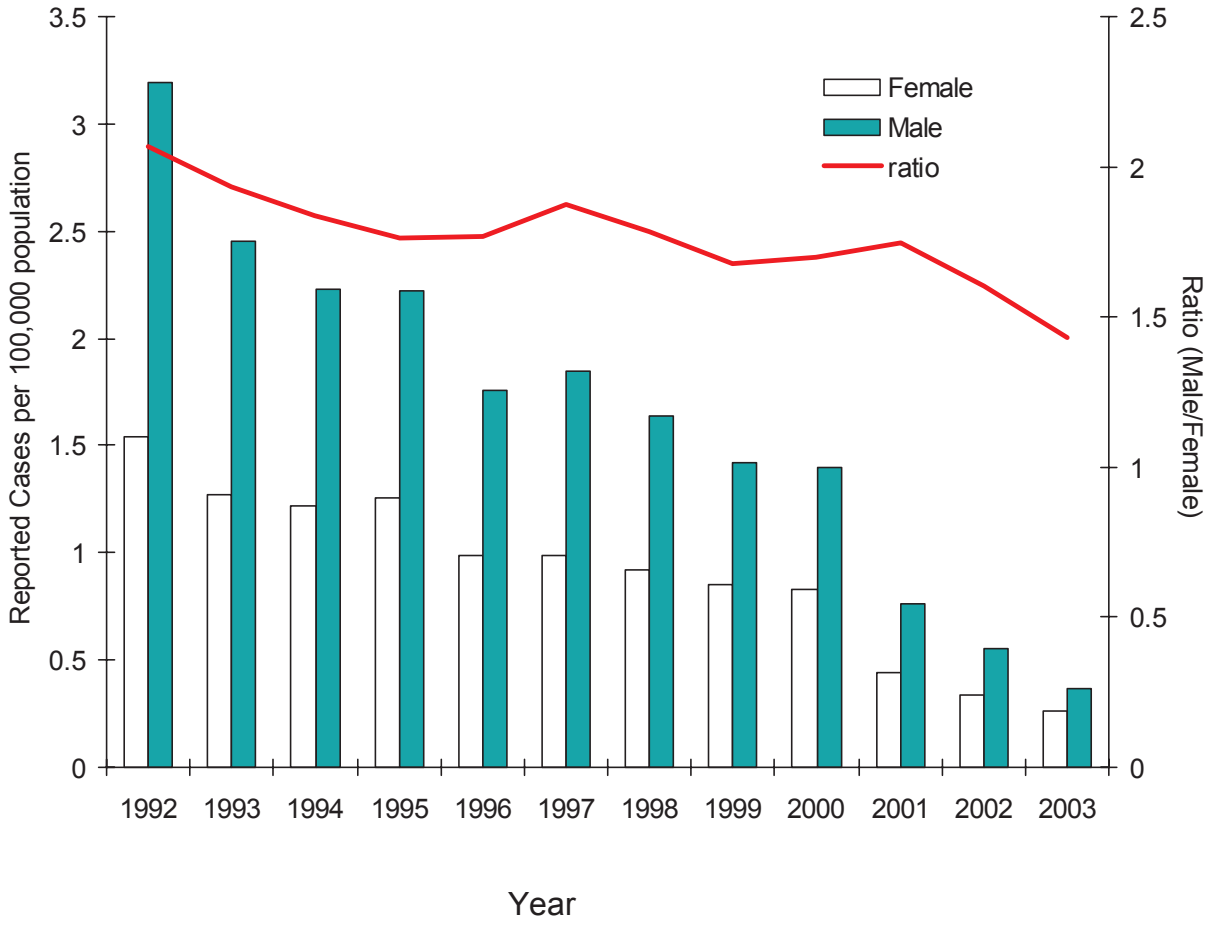


Figure 22: Incidence of Reported Acute Hepatitis C, by Age and Sex, United States, 2003

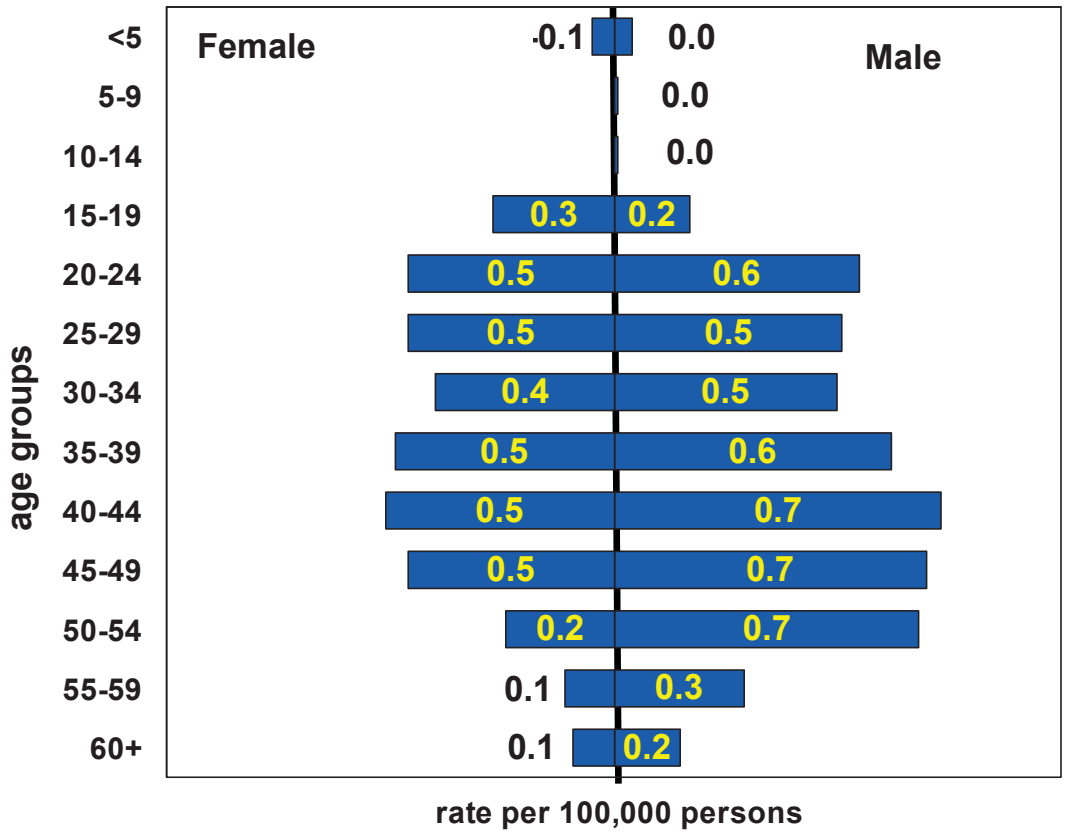


Figure 23 Incidence of Reported Acute Hepatitis C/NANB, by Race and Ethnicity, United States, 1992-2003

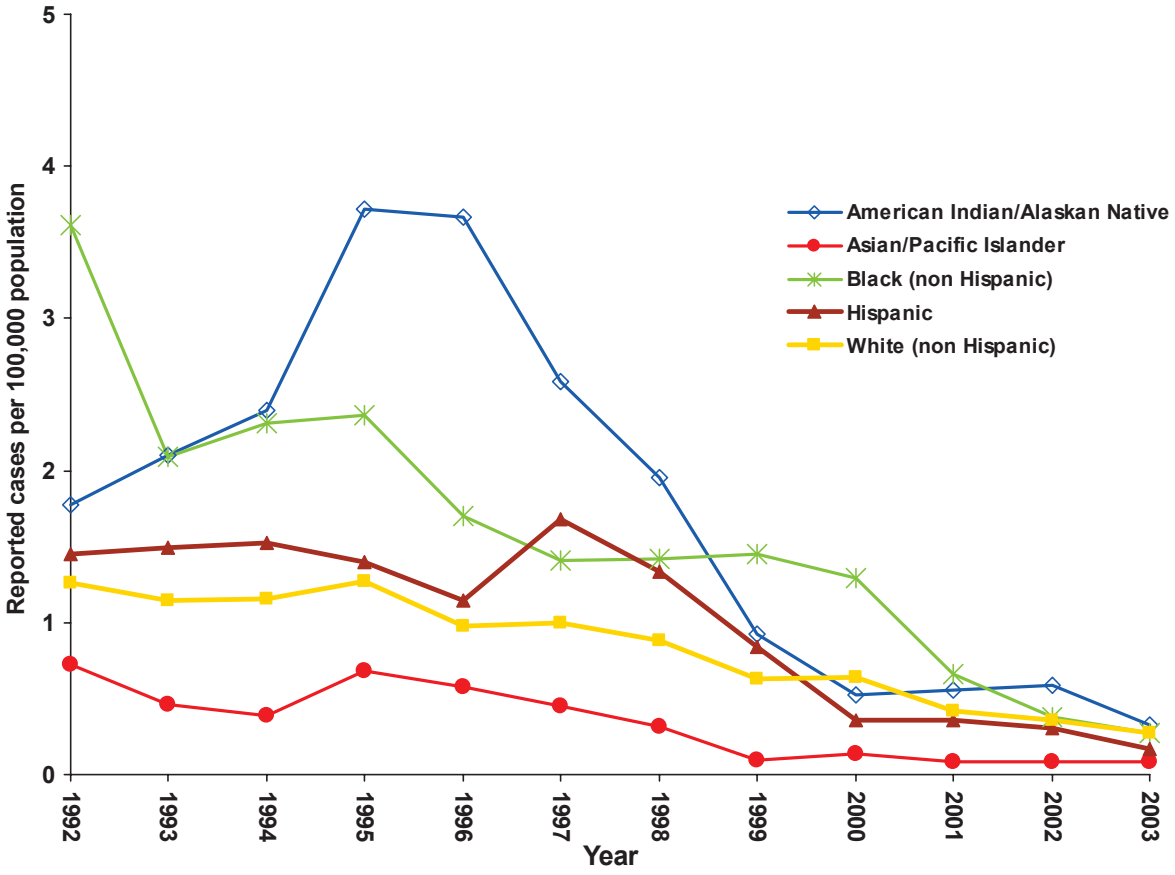
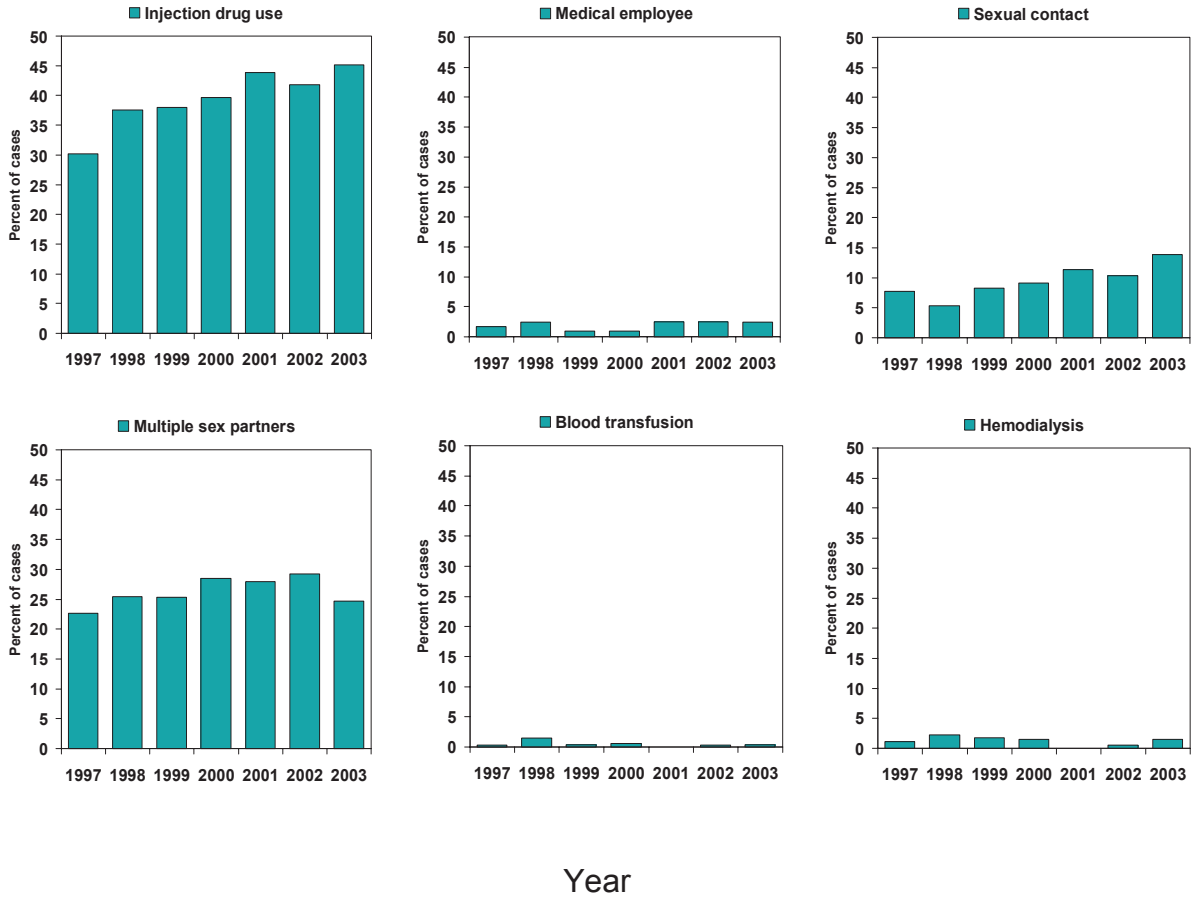


Table 8: Epidemiologic Characteristics of Patients Reported with Acute Hepatitis C, by Age, United States, 2003

Exposures during the 6 weeks-6 months before illness onset	Age Groups								
	<40*			40+			Total		
	n	N	%	n	N	%	n	N	%
Injection drug use	93	152	61.2	26	110	23.6	119	262	45.4
Employment in medical/dental field	2	141	1.4	4	113	3.5	6	254	2.4
Hemodialysis	.	114	.	3	87	3.4	3	201	1.5
Sexual contact with hepatitis C patient	11	86	12.8	13	83	15.7	24	169	14.2
Household contact of hepatitis C patient	3	86	3.5	7	83	8.4	10	169	5.9
More than one sex partner	22	97	22.7	22	74	29.7	44	171	25.7
Blood transfusion	.	139	.	1	106	0.9	1	245	0.4
Surgery	11	126	8.7	22	100	22.0	33	226	14.6
Percutaneous injury (e.g. needlestick)	11	106	10.4	5	88	5.7	16	194	8.2
No risk factor identified	75	191	39.3	57	129	44.2	132	320	41.3
No risk factor data reported	.	265	.	.	304	.	.	569	.
TOTAL	.	456	.	.	433	.	.	889	.

*38(4%) of these cases were <19 years of age

Figure 24: Trends in Selected Epidemiologic Characteristics among Patients Reported with Acute Hepatitis C/NANB, by Year



Note: The percentage of cases reporting a specific risk factor was calculated based on the total number of cases reporting any information for that exposure. Multiple risk factors can be reported for a single case.

Table 9: Clinical Characteristics of Patients Reported with Acute Hepatitis C by Age, United States, 2003

	<15			15-39			40-59			60+			All		
	n	N	%	n	N	%	n	N	%	n	N	%	n	N	%
Died From Hepatitis	0	9	0.0	1	282	0.4	1	263	0.4	4	29	13.8	6	583	1.0
Hospitalized for Hepatitis	1	6	16.7	84	219	38.4	56	149	37.6	9	20	45.0	150	394	38.1
Jaundice	4	5	80.0	116	207	56.0	98	145	67.6	12	19	63.2	230	376	61.2

A total of 891 cases of Hepatitis C were reported. Percentages are calculated based upon the number of cases reported with non-missing data for age, and for outcome of interest (i.e. jaundice, hospitalization or death).

Future Directions

Surveillance for acute viral hepatitis

Hepatitis A: Continued monitoring of national and state-specific incidence rates is needed to determine if the dramatic decline in rates that has occurred following introduction of hepatitis A vaccines in this country is sustained and the extent to which it is attributable to vaccination. Enhanced investigation of cases reported in children living in states included in the recommendations for routine childhood hepatitis A vaccination and in other groups for which vaccination is recommended (e.g. travelers, men who have sex with men) is needed to determine if and why these individuals were not vaccinated so that additional cases can be prevented.

Hepatitis B: The analysis of surveillance data will continue to provide critical information to assess the impact of the national strategy for eliminating HBV transmission in the United States. With ongoing vaccination of infants and children, it is expected that the number of cases occurring in young age groups will continue to decline. Enhanced investigation of cases reported in children and other groups for which vaccination is recommended (e.g. health care workers, men who have sex with men) is needed to determine if and why these individuals were not vaccinated so that additional cases can be prevented. In addition, the investigation of cases occurring in risk groups can identify settings in which these individuals might be reached with vaccine. The investigation of new cases identified in older persons or others who do not have typical risk factors (e.g., multiple sex partners, recent IDU) for HBV should be done to identify outbreaks associated with health care or other unusual settings.

Hepatitis C/NANB: The incidence of acute hepatitis C continues to decline and outbreaks are rare. However, the investigation of any new infection is needed to identify and control ongoing sources of transmission. In particular, investigation of new cases occurring in persons who do not have typical risk factors (e.g., recent IDU) for HCV infection is needed to identify outbreaks associated with health care or other unusual settings. Case investigation efforts should be focused on the investigation of cases of acute disease or documented cases of seroconversion.

Surveillance for perinatal HBV infection: Reporting of perinatal HBV infection through NETSS began in 2001. In 2001, a total of 30 cases were reported by seven states. In 2002, the number of states reporting increased to 17 with a total of 63 cases reported and in 2003, 80 cases were reported by 15 states. However, not all states have begun reporting through this mechanism. Based on estimations made using other data sources[6], approximately 1000 infants were infected with HBV in 2001 of whom 80% will remain chronically infected. Once reporting mechanisms are stabilized, analysis of reported cases will be included as part of this report.

Surveillance for chronic hepatitis virus infections: To date, national surveillance has been conducted for cases of acute disease only. However, in June 2002, the Council of State and Territorial Epidemiologists voted to include chronic HBV infection and HCV infection (past or present) in the list of nationally notifiable diseases and approved a case definition for each of these conditions. Since January 2003, 20 states have begun reporting these cases electronically through NETSS to CDC. Once reporting mechanisms are stabilized, these reports will be evaluated and included as part of this report. The approved case definitions for chronic HBV infection and HCV infection (past or present) are available at www.cdc.gov/epo/dphsi/casedef/. The identification and reporting of chronically infected persons is needed to facilitate follow-up of these individuals to ensure that they are receiving appropriate interventions including counseling and referral for medical evaluation. In addition, it will allow states to determine the characteristics of persons being identified with chronic infection and provide data that can be used to describe the local burden of disease due to HBV and HCV infection.

Appendix I: Viral Hepatitis Case Report Form

VIRAL HEPATITIS CASE RECORD
FOR REPORTING OF PATIENTS WITH SYMPTOMATIC ACUTE VIRAL HEPATITIS
(SEE CASE DEFINITION ON REVERSE)

STATE GEOGRAPHIC CODE ___ ___ ___ ___ ___ (1) (2) (3) (4) (5)
STATE CASE N0. ___ (8) (9) (10) (11)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Centers for Disease Control and Prevention
Hepatitis Branch, (G37)
Atlanta, Georgia 30333

CDC CASE NO. ___ (8) (9) (10) (11)

PATIENT'S LAST NAME (please print clearly) (12-26) | FIRST AND MIDDLE NAME (or initials) | OCCUPATION

STREET ADDRESS | TOWN OR CITY | STATE (Zip Code) | COUNTY (27-36) | COUNTY FIPS CODE (37-40)

AGE (yrs) (41-42) ___ ___ 00 = < 1yr 99 = Unk

DATE OF BIRTH (43-48) __ __ / __ __ / __ __ Mo Day Yr

SEX (49) 1 ☐ Male 2 ☐ Female 9 ☐ Unk

RACE (50) 1 ☐ American Indian or Alaskan Native 2 ☐ Asian or Pacific Islander 3 ☐ Black 5 ☐ White 9 ☐ Unk

ETHNICITY (51) 1 ☐ Hispanic 2 ☐ Non-Hispanic 9 ☐ Unk

Reporting physician's diagnosis (52-53) 1 ☐ Hepatitis A 2 ☐ Hepatitis B 3 ☐ Non-A, Non-B Hepatitis 4 ☐ Hepatitis D (Delta) 5 ☐ Hepatitis Unspecified

DO NOT REPORT CASES OF CHRONIC HEPATITIS OR CHRONIC CARRIERS!!

CLINICAL DATA

	Mo Day Yr
Date of first symptom (54-59)	___ ___ / ___ ___ / ___ ___
Date of diagnosis (60-65)	___ ___ / ___ ___ / ___ ___
Was the patient jaundiced? (66)	1 ☐ Yes 2 ☐ No
Was the patient hospitalized for hepatitis? (67)	1 ☐ Yes 2 ☐ No
Did the patient die from hepatitis? (68)	1 ☐ Yes 2 ☐ No

LABORATORY RESULTS

	Pos	Neg	Not Tested/Unk
IgM Hepatitis A antibody (IgM anti-HAV) (69)	1 ☐	2 ☐	9 ☐
Hepatitis B surface antigen (HBsAg) (70)	1 ☐	2 ☐	9 ☐
IgM Hepatitis B core antibody (IgM anti-HBc) (71)	1 ☐	2 ☐	9 ☐
Antibody to Delta (anti-HDV) (72)	1 ☐	2 ☐	9 ☐

For purposes of National Surveillance, ASK ALL OF THE FOLLOWING QUESTIONS FOR EVERY CASE OF HEPATITIS. These questions may help determine where the patient acquired his/her infection. Please refer to the work sheet on the back of the last page for additional questions.

During the 2-6 weeks prior to illness	Yes	No	Unk
1. was the patient a child or employee in a nursery, day care center, or preschool? (73)	1 ☐	2 ☐	9 ☐
2. was the patient a household contact of a child or employee in a nursery, day care center, or preschool? (74)	1 ☐	2 ☐	9 ☐
3. was the patient a contact of a confirmed or suspected hepatitis A case? (75)	1 ☐	2 ☐	9 ☐
If yes, type of contact: (76) 1 ☐ Sexual 2 ☐ Household (non-sexual) 3 ☐ Other			
4. was the patient employed as a food handler? (77)	1 ☐	2 ☐	9 ☐
5. did the patient eat raw shellfish? (78)	1 ☐	2 ☐	9 ☐
6. was the patient suspected as being part of a common-source foodborne or waterborne outbreak? (79)	1 ☐	2 ☐	9 ☐
7. did the patient travel outside of the U.S. or Canada? (80)	1 ☐	2 ☐	9 ☐
If yes, where: (81) 1 ☐ So./Central America (including Mexico) 2 ☐ Africa 3 ☐ Caribbean 4 ☐ Middle East 5 ☐ Asia/So. Pacific 6 ☐ Australia/New Zealand 7 ☐ Other_____			
Duration of stay: (82) 1 ☐ 1-3 Days 2 ☐ 4-7 Days 3 ☐ More than 7 Days			
During the 6 weeks-6 months prior to illness			
8. was the patient a contact of a confirmed or suspected acute or chronic hepatitis B or non-A, non-B case? (83)	1 ☐	2 ☐	9 ☐
If yes, type of contact: (84) 1 ☐ Sexual 2 ☐ Household (non-sexual) 3 ☐ Other			
9. was the patient employed in a medical, dental or other field involving contact with human blood? (85)	1 ☐	2 ☐	9 ☐
If yes, degree of blood contact: (86) 1 ☐ Frequent (several times weekly) 2 ☐ Infrequent			
10. did the patient receive blood or blood products (transfusion)? (87)	1 ☐	2 ☐	9 ☐
If yes, specify date(s) received: (88-93) From ___ ___/___ ___/___ ___ to ___ ___/___ ___/___ ___ (94-99)			
11. was the patient associated with a dialysis or kidney transplant unit? (100)	1 ☐	2 ☐	9 ☐
If yes, (101) 1 ☐ Patient 2 ☐ Employee 3 ☐ Contact of patient or employee			
12. did the patient use needles for injection of street drugs? (102)	1 ☐	2 ☐	9 ☐
13. what was the patient's sexual preference? (103) 1 ☐ Heterosexual 2 ☐ Homosexual 3 ☐ Bisexual 9 ☐ Unk			
14. how many different sexual partners did the patient have? (104) 1 ☐ None 2 ☐ One 3 ☐ 2-5 4 ☐ More than 5 9 ☐ Unk			
15. did the patient have			
dental work or oral surgery? (105) 1 ☐ Yes 2 ☐ No 9 ☐ Unk tattooing? (108)	1 ☐	2 ☐	9 ☐
other surgery? (106) 1 ☐ Yes 2 ☐ No 9 ☐ Unk an accidental stick or puncture with a needle			
acupuncture? (107) 1 ☐ Yes 2 ☐ No 9 ☐ Unk or other object contaminated with blood? (109)	1 ☐	2 ☐	9 ☐
Has this patient ever received the three dose series of Hepatitis B vaccine? (110)	1 ☐	2 ☐	9 ☐
If yes, what year? (111-112) ___ ___ AND was the patient tested for antibody within 1-6 months after the last dose? (113)	1 ☐	2 ☐	9 ☐
If yes, was the antibody test: (114) 1 ☐ Pos 2 ☐ Neg 3 ☐ Unknown			

Comments: _____

Investigator's Name _____

Date _____

CDC 53.1 Rev. 6-93

Form Approved
OMB No. 0920-0009

WORK SHEET

CASE DEFINITION FOR REPORTING OF ACUTE VIRAL HEPATITIS

Illness with: 1) discrete onset of symptoms and
2) jaundice or elevated serum aminotransferase levels.

Hepatitis A: IgM anti-HAV positive.

Hepatitis B: IgM anti-HBc positive if done or HBsAg positive and IgM anti-HAV negative if done.

Non-A, Non-B Hepatitis: 1) IgM anti-HAV negative, and
2) IgM anti-HBc negative if done or HBsAg negative, and
3) serum aminotransferase levels greater than 2 1/2 times the upper limit of normal.

Delta Hepatitis: 1) HBsAg or IgM anti-HBc positive and
2) Anti-HDV positive.

FOR USE BY LOCAL HEALTH DEPARTMENTS TO DETERMINE THE PATIENT'S MOST PROBABLE SOURCE OF INFECTION

Patient's name_____ Home phone_____ Employed by_____ Work phone_____
Reporting physician's name, address, and phone #_____

If patient was hospitalized for hepatitis, give name of hospital_____
Results of liver function tests: SGOT (AST)_____ SGPT (ALT)_____ Bilirubin_____

FURTHER INFORMATION FOR ADMITTED RISK FACTORS AND SOURCES LISTED ON FRONT PAGE

IF APPLICABLE:

1. Name, address, and phone # of child care center_____
2. Name and address of school, grade, classroom attended_____
3. Name, address, and phone # of restaurant where food handler worked **(HEPATITIS A ONLY)**_____
4. Food history of patient for the 2-6 wks prior to onset: **(HEPATITIS A ONLY)**
   a. name and location of restaurants_____
   b. name and location of food stores_____
   c. name and location of bakery_____
   d. group meals attended (e.g., reception, church, meeting, etc.)_____
   e. location raw shellfish purchased_____
5. Name, address, and phone # of known hepatitis A or hepatitis B contact_____
   _____ Relationship_____
6. **CONTACTS REQUIRING PROPHYLAXIS FOR HEPATITIS A OR HEPATITIS B**

Name	Age	Relationship to case	IG	HBIG	Vaccine

7. If transfused, **NOTIFY BLOOD CENTER!** Name of blood center_____
   a. number of units of whole blood, packed RBC or frozen RBC received_____
   b. specify type of blood product (e.g., albumin, fibrinogen, factor VIII, etc.)_____
8. **IF DONOR**, name, address, and phone # of donor or plasmapheresis center_____
   _____ Date_____
9. Name, address, and phone # of dialysis center_____
10. Name, address, and phone # of dentist or oral surgeon_____
11. If other surgery performed, name, address, and phone # of location_____
12. Name, address, and phone # of acupuncturist or tattoo parlor_____
13. Is patient currently pregnant?_____ If yes, give obstetrician's name, address and phone #_____
    a. estimated date and location of delivery_____

Comments:_____

_____Investigator's Name and Title_____Date of Interview_____

CDC 53.1 Work sheet REV. 6-93

Work sheet

1st Copy – Local Health Department **2nd Copy – Centers for Disease Control** **3rd Copy – State Health Department**

References

[1] CDC. Prevention of hepatitis A through active or passive immunization. MMWR 1996; 45(RR:15)

[2] CDC. Prevention of hepatitis A through active or passive immunization. MMWR 1999; 48(RR:12)

[3] CDC. Hepatitis B virus: A comprehensive strategy for eliminating transmission in the United States through universal childhood vaccination. MMWR 1991; 40(RR:13)

[4] Alter, MJ et al. The prevalence of hepatitis C virus infection in the United States. N Engl J Med 1999; 341:556-62.

[5] CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR 1998; 47(RR:19)

[6] U.S. Department of Health and Human Services. Healthy People 2010. 2nd ed. (Washington, DC: U.S. Government Printing Office, November 2000)